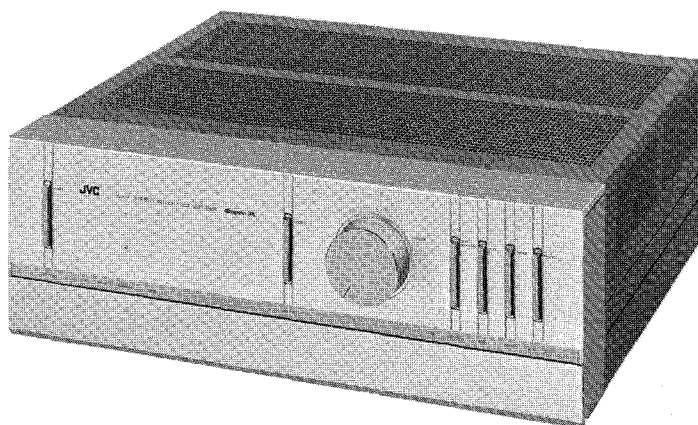


# JVC

## SERVICE MANUAL

**MODEL  
A-X9**

**STEREO INTEGRATED AMPLIFIER**




No. 2480  
JUN. 1979

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**Warning:**

When replacing the parts marked with , be sure to use the designated parts to ensure safety.

# 1. Specifications

## ALLOVER CHARACTERISTICS

Output Power (Tuner, Aux, Tape → SP. out)	: 100 watts per channel min. RMS (both channels driven, into 8 ohms from 20 Hz to 20 kHz with THD less than 0.005 %) 105 watts per channel min. RMS (both channels driven, into 8 ohms at 1 kHz)
Total Harmonic Distortion (Tuner, Aux, Tape → SP. out)	: 0.005 % at rated output, from 20 Hz to 20 kHz, 8 ohms 0.0005 % at rated output at 1 kHz, 8 ohms (Measured by HP-IB AUDIO ANALYZER SYSTEM) 0.02 % at rated output, from 20 Hz to 80 kHz, 8 ohms
Intermodulation Distortion (Tuner, Aux, Tape → SP. out)	: 0.002 % at rated output, 8 ohms
Power Band Width (Tuner, Aux, Tape → SP. out)	: 5 Hz — 100 kHz (IHF, both channels driven, 8 ohms, 0.02 % THD)
Frequency Response (Tuner, Aux, Tape → SP. out)	: DC — 200 kHz $\begin{smallmatrix} +0 \\ -3 \end{smallmatrix}$ dB
Damping Factor	: 200 (1 kHz, 8 ohms)
Input Sensitivity/Impedance	
Phono — 1, 2 (MM)	: 2.5 mV/100, 47 k, 100 kohms
Phono — 1, 2 (MC)	: 200 $\mu$ V/100 ohms
TUNER, AUX, TAPE	: 200 mV/50 kohms
Signal to Noise Ratio	
Phono — 1, 2 (MM)	: 85 dB (IHF, A net, short circuit), 82 dB (NEW IHF)
Phono — 1, 2 (MC)	: 71 dB (IHF, A net, short circuit), 75 dB (NEW IHF)
TUNER, AUX, TAPE	: 110 dB (IHF, A net, short circuit), 85 dB (NEW IHF)
Tone Controls	
BASS	: $\pm 8$ dB (100 Hz)
TREBLE	: $\pm 8$ dB (10 kHz)
Subsonic Filter	: -6 dB/oct. (18 Hz)
Muting	: -20 dB
<b>PHONO EQUALIZER SECTION</b> (Phono → Rec. Out.)	
Phono Overload	
Phono — 1, 2 (MM)	: 350 mV at 1 kHz, 0.005 % THD
Phono — 1, 2 (MC)	: 26 mV at 1 kHz, 0.005 % THD
RIAA Phono Equalization	: $\pm 0.2$ dB (20 Hz — 20 kHz)
Total Harmonic Distortion	
Phono — 1, 2 (MM)	: 0.004 % at 25 V output, 20 Hz — 20 kHz
Phono — 1, 2 (MC)	: 0.006 % at 25 V output, 20 Hz — 20 kHz
Rec. Output/Impedance	: 200 mV/330 ohms
Dimensions	: 6-1/4"(H) x 17-3/4"(W) x 16-3/4"(D) (15.9 cm(H) x 45.0 cm(W) x 42.4 cm(D))
Weight	: 36.5 lbs (16.6 kg)

## Power Source and Power Consumption

Areas	Line Voltage & Frequency	Power Consumption
U.S.A.	AC 120 V, 60 Hz	400 W
CANADA	AC 120 V, 60 Hz	505 VA
EUROPE	AC 110/120/220/240 V~	660 W
U.K. & AUSTRALIA	Selectable, 50 Hz	
OTHER AREAS	AC 110/120/220/240 V~	660 W
	Selectable, 50/60 Hz	

*Design and specifications subject to change without notice.*

## 2. Removal of Top Cover and Bottom Plate

### Procedure (Top Cover)

1. Remove 4 screws from the Metal cover.
2. Remove 2 screws from the rear panel back of Metal cover.

### Procedure (Bottom Plate)

1. Remove 18 screws from the bottom cover.

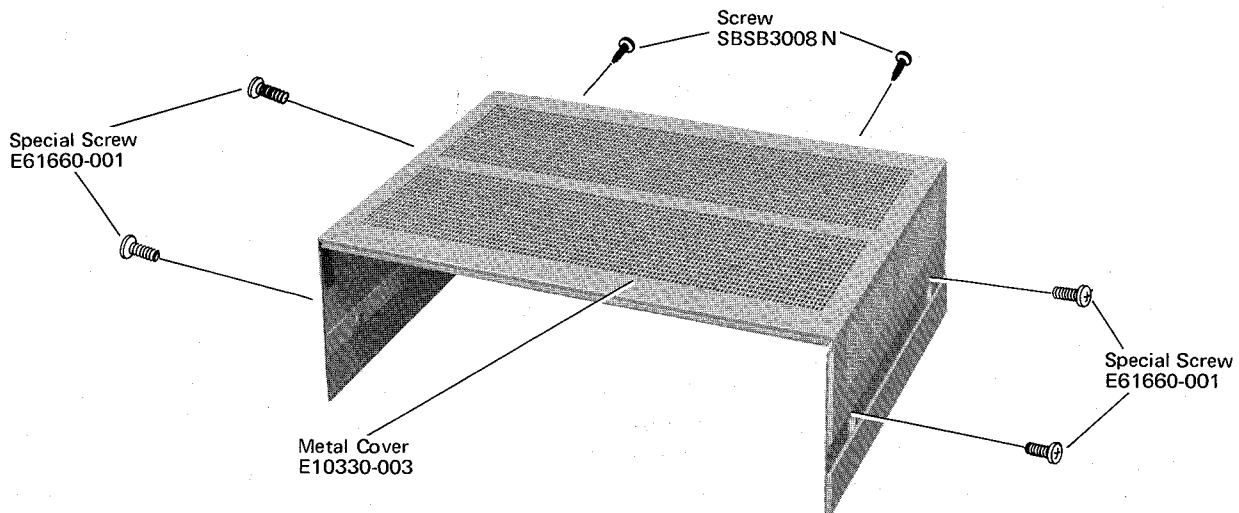


Fig. 1

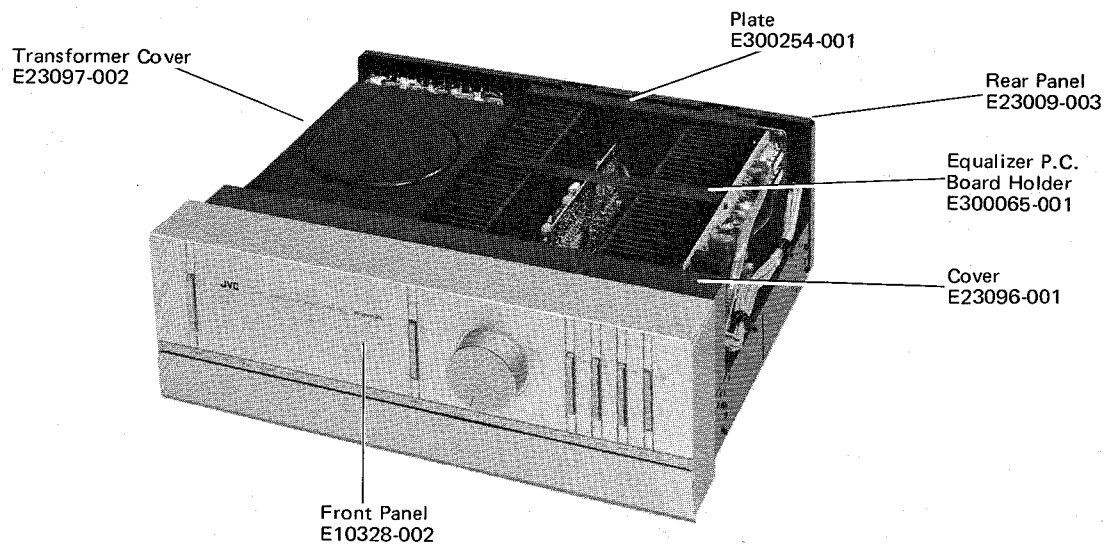


Fig. 2

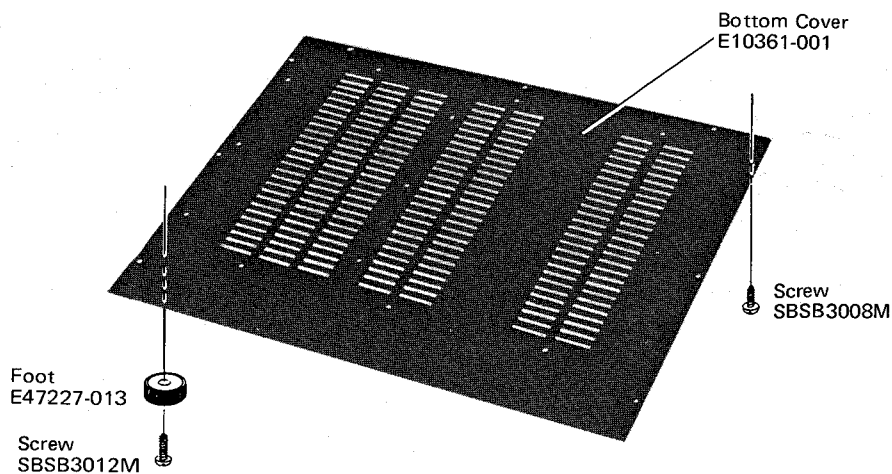


Fig. 3



# 3. Main Parts Location and Part Numbers

## Top View

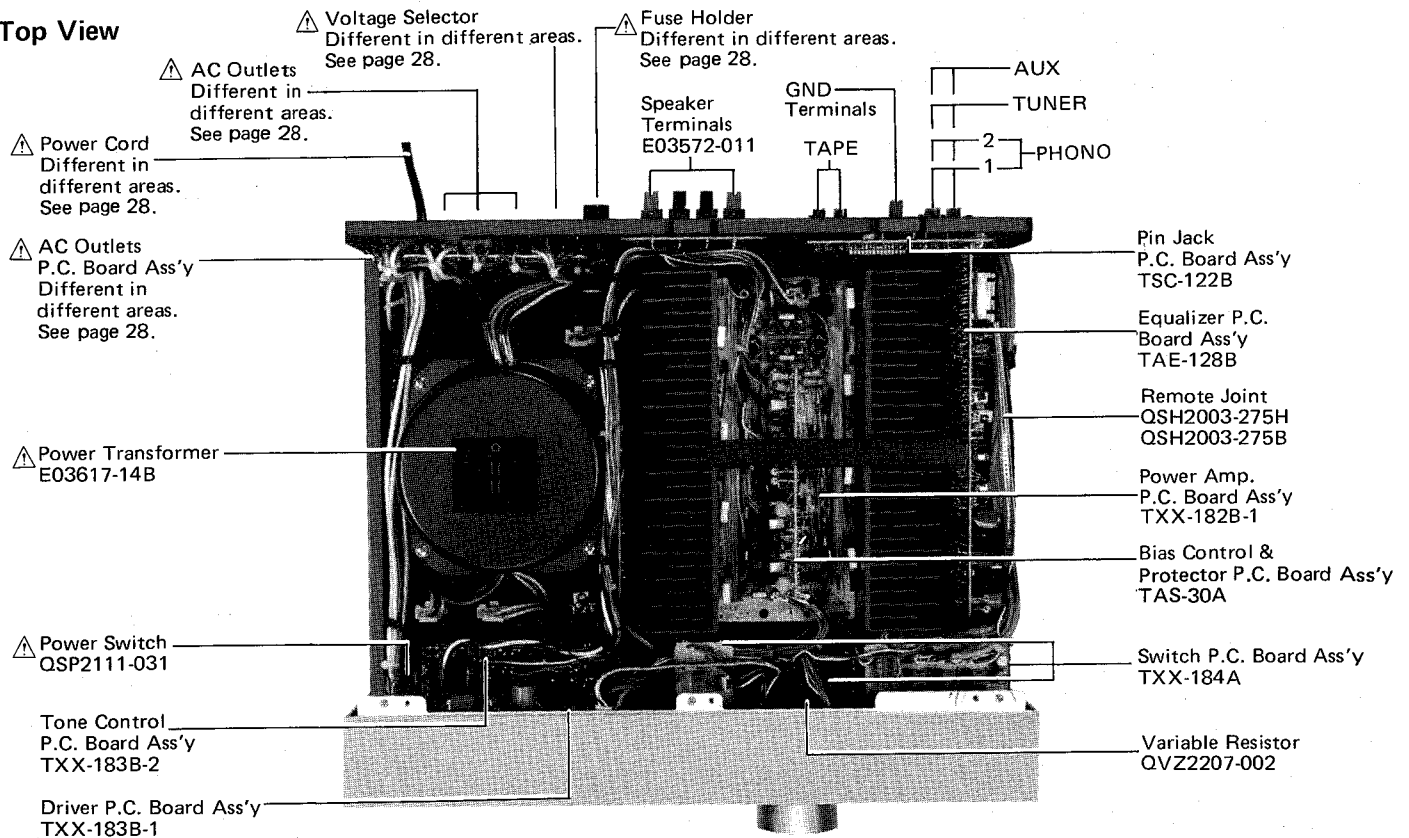


Fig. 4

## Bottom View

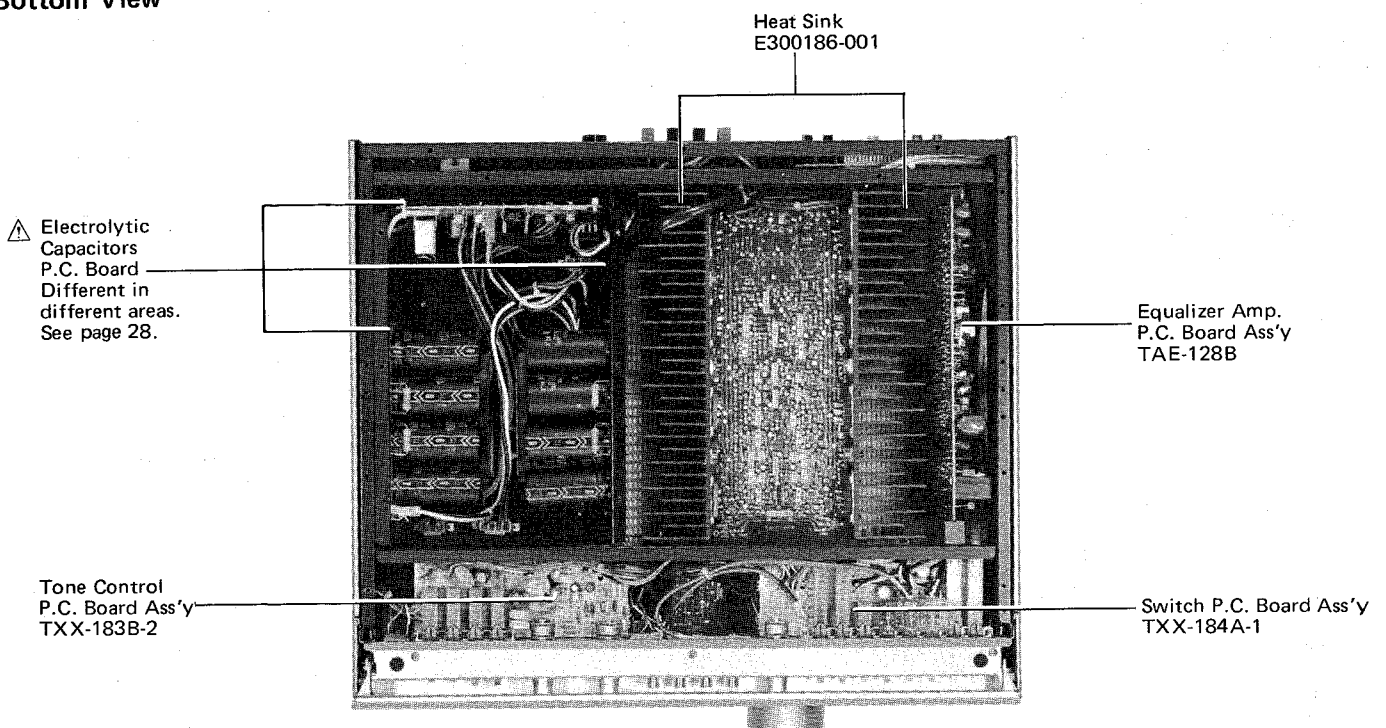


Fig. 5

NOTE: ⚠ SAFETY PARTS

# 4.Exploded Views and Part Numbers

## 4-(1) Front Panel

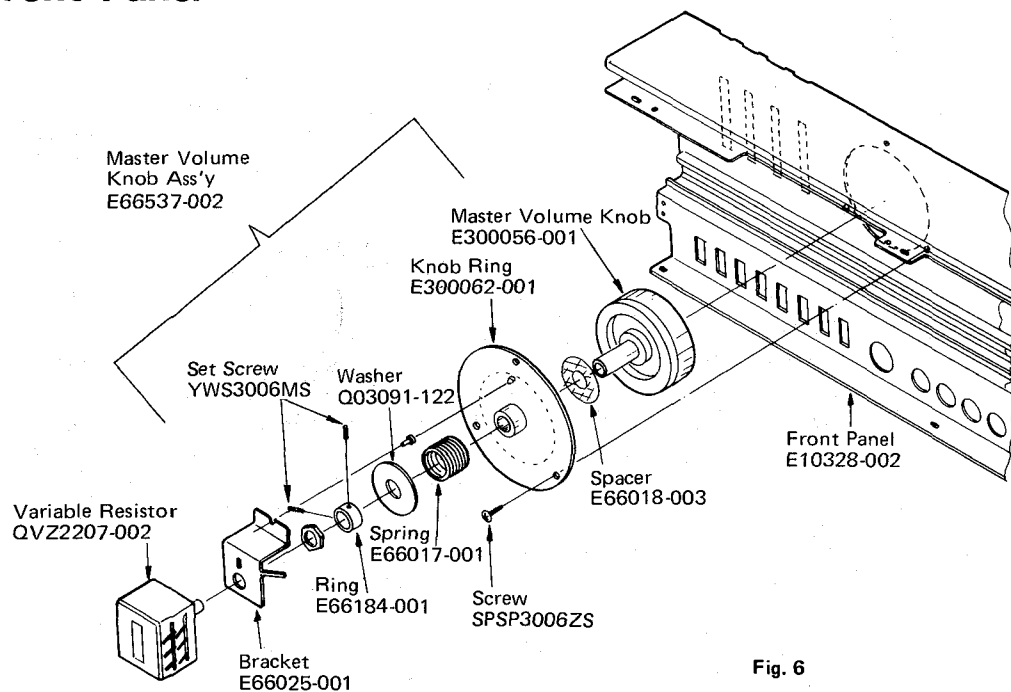


Fig. 6

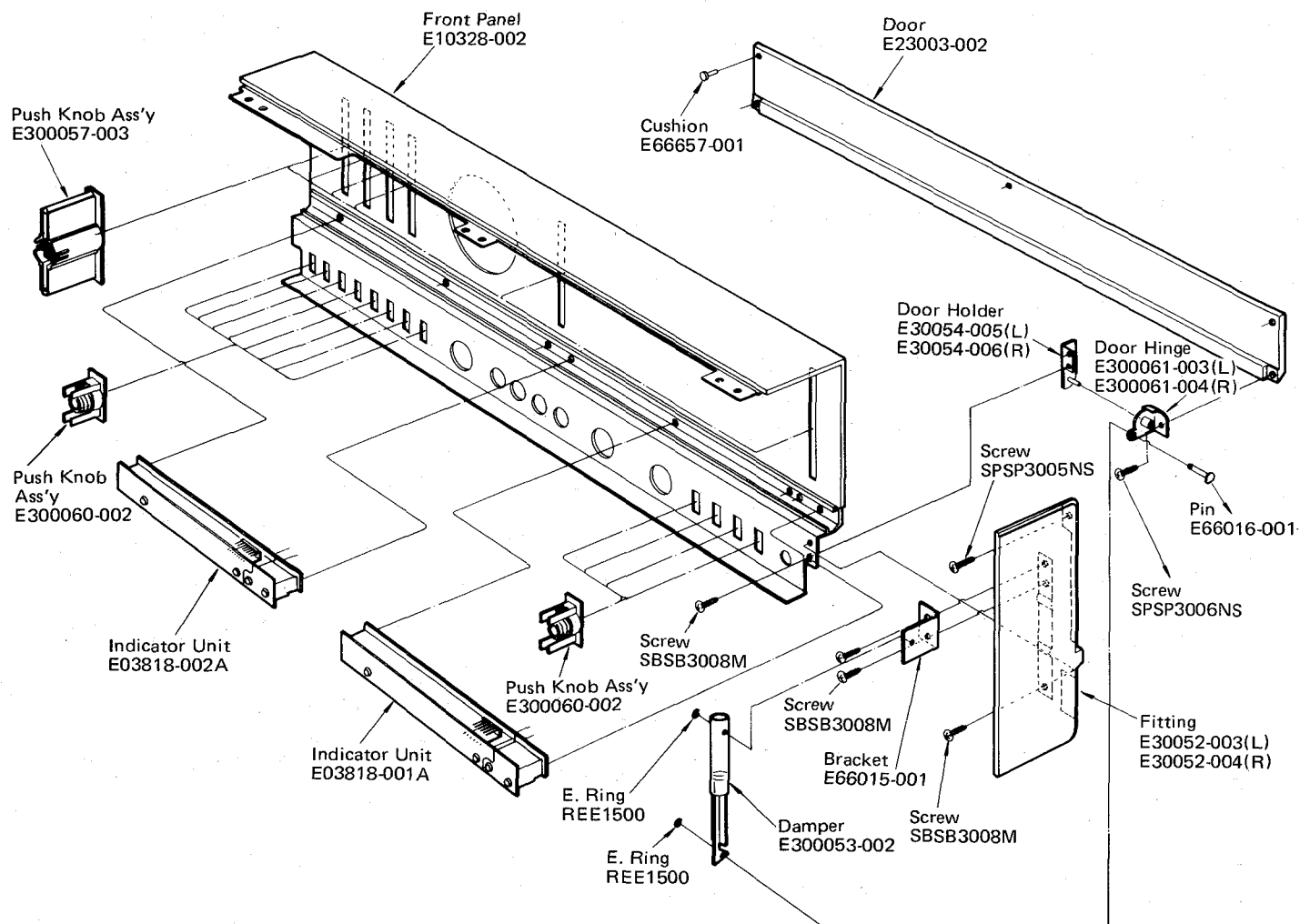


Fig. 7

## 4-(2) Rear Panel

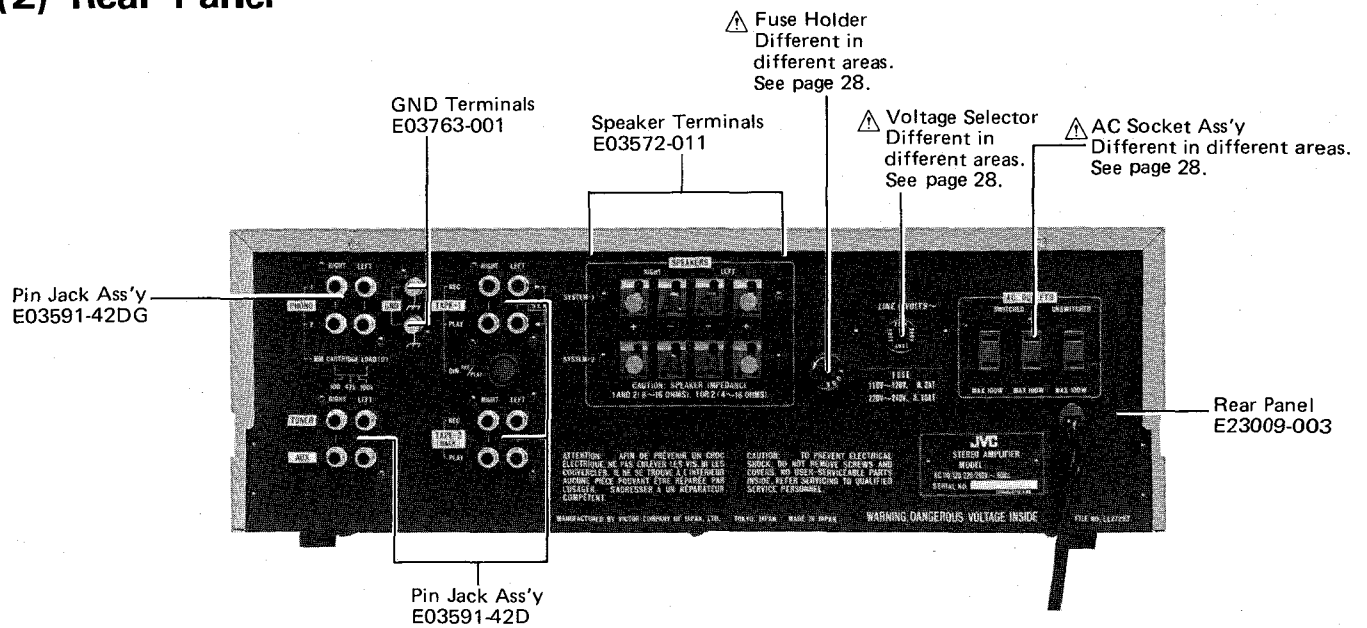


Fig. 8

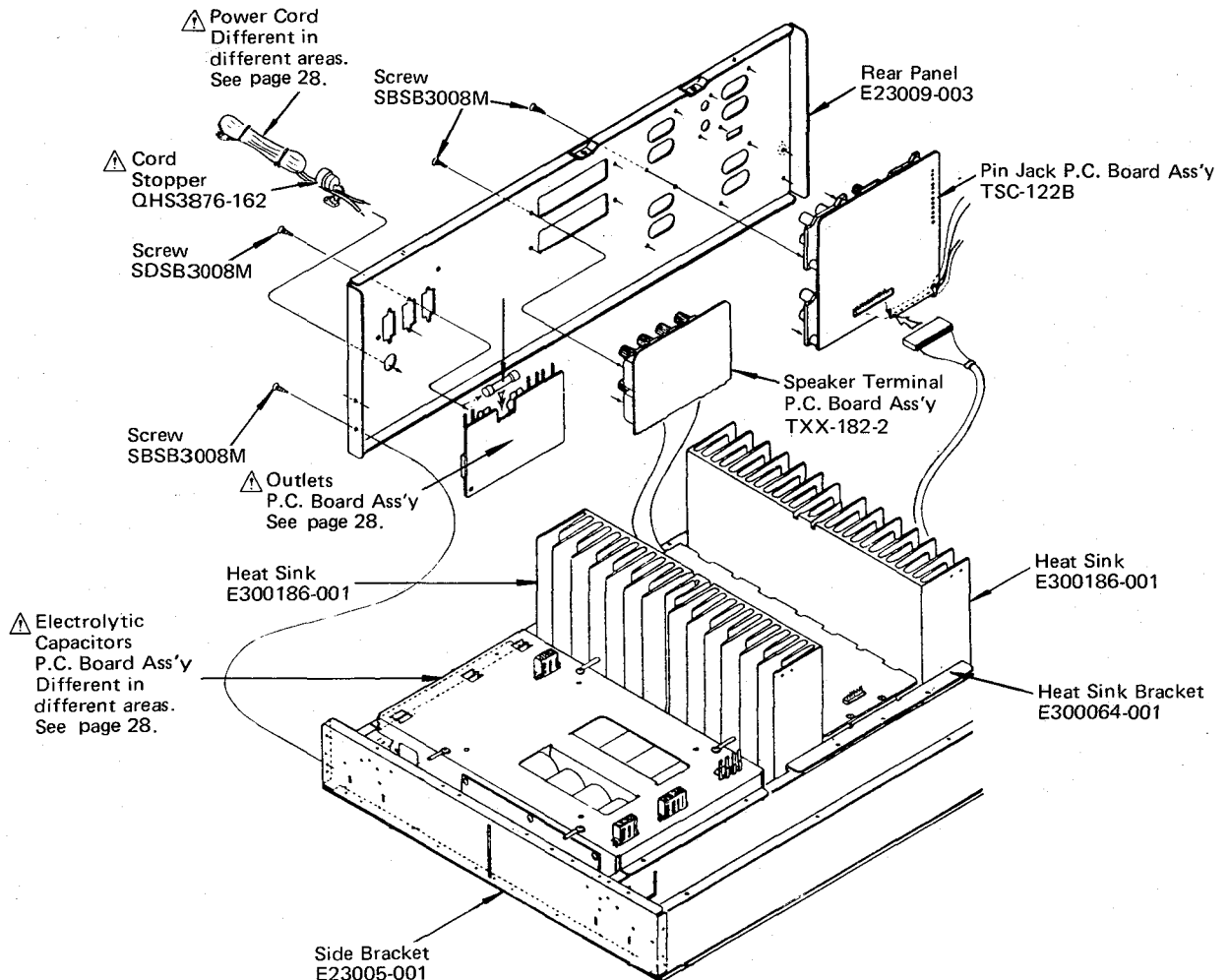


Fig. 9

NOTE: ⚠ SAFETY PARTS

## 4-(3) Equalizer and Power Transformer

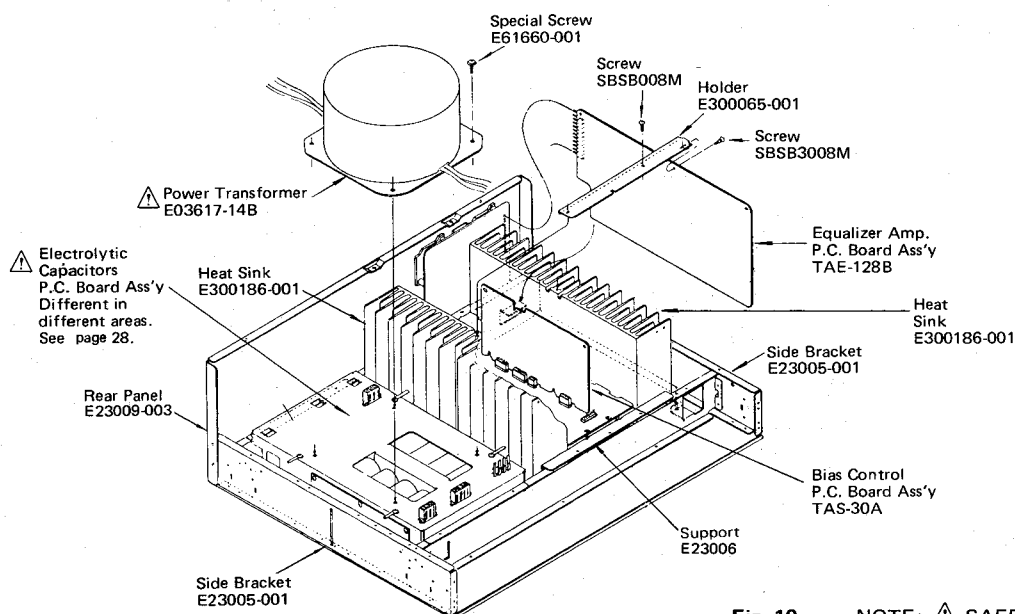


Fig. 10 NOTE: ⚠ SAFETY PARTS

## 5. Block Diagram

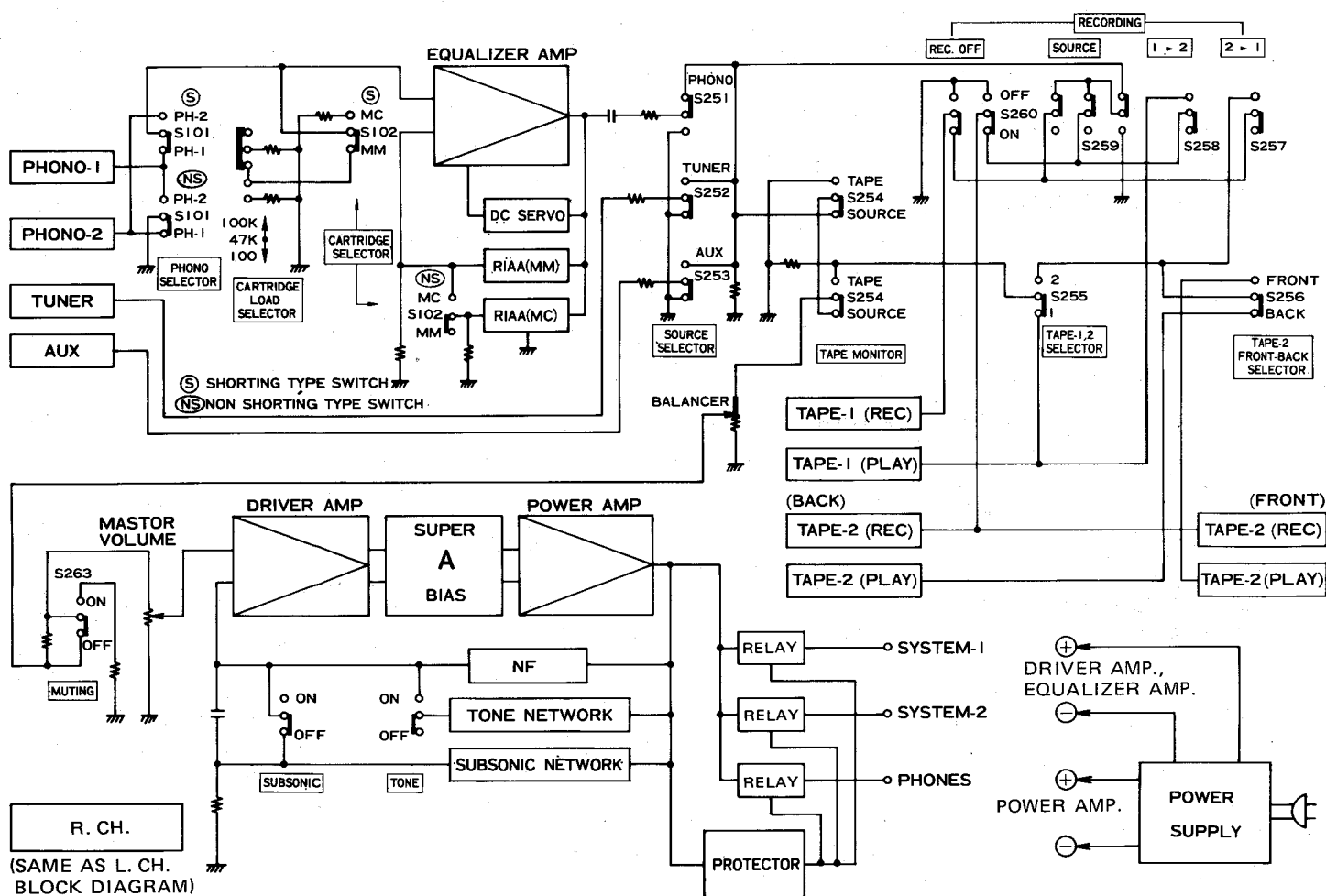


Fig. 11

## 6. Adjustment Procedures

### 6-(1) Main Amp. Center Voltage

1. Before tuning on the power, set semi-fixed resistors R305 (L channel) and R306 (R channel) of the drive amplifier and regulated power voltage amplifier circuit

board (TXX-183B-1) to the center position (refer to Fig. 12).

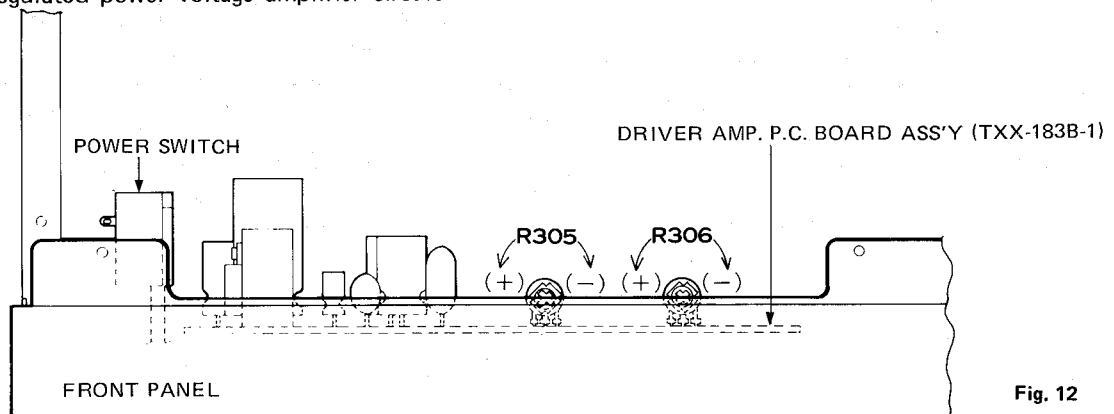


Fig. 12

2. Five minutes after the power is turned on, adjust semi-fixed resistors R305 and R306 so that the voltage between the test points of the power circuit board becomes  $\pm 10$  mV or less.

L channel: Measure the voltage between test point 19 and test point 22 (ground).

R channel: Measure the voltage between test point 7 and test point 4 (ground).

The measurements can also be performed at the speaker terminals if the relay is operating normally.

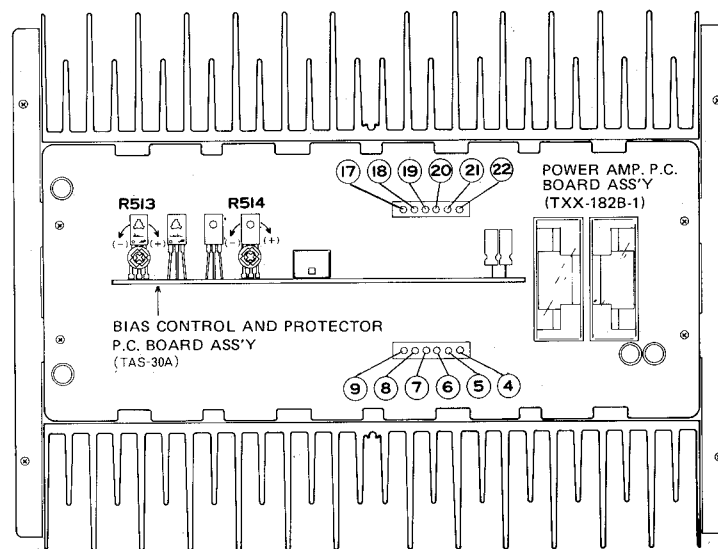


Fig. 13

### 6-(2) Main Amp. Idling Current

1. Before turning on the power, turn semi-fixed resistors, R513 (L channel) and R514 (R channel) of the bias control and protection circuit board, fully counterclockwise (refer to Fig. 13).

2. After turning the power on, adjust R513 and R514 and so that the voltage between the test points of the power amplifier (see Fig. 13) is within the range 40 mV – 60 mV.

L channel: Measure the voltage between test points 17, 18, 20 and 21, and test point 19 (center point).

R channel: Measure the voltage between test points 5, 6, 8 and 9, and test point 7 (center point).

3. About 10 minutes after the power is turned on with the heat sink hot enough, readjust R513 and R514 so that the voltage between the test points becomes 50 mV. Then, confirm that no voltage variation is observed after the heat sink temperature increases further.

**Note:** Be sure to perform the measurement with the probes and cabinet of the measuring equipment separated from the ground terminals of A-X9 or of other measuring equipment.

The A-X9 may be damaged if this is neglected.

# 7. Servicing Procedures

## 7-(1) Main Amp.

Troubleshooting and servicing for damaged power transistors are most difficult with this unit.

These are explained here.

The power amplifier of A-X9 has a configuration shown in Fig. 14. Servicing should be performed with consideration paid for separation of the stages.

Standard simplified servicing methods must be avoided when repairing the Super A amp. Turning on the power immediately after replacing the power transistors because they have been damaged or replacing the parts for the right channel with those for the left channel or vice versa (this

method is often employed when repairing a stereo circuit) must be avoided strictly.

**Note:** Servicing procedures for the left channel are given here together with those necessary for the right channel. However, similar servicing should be performed for both channels at the same time so that the performance of the left and right channels is the same.

If this is neglected, the parts of the channel which was normal may be damaged.

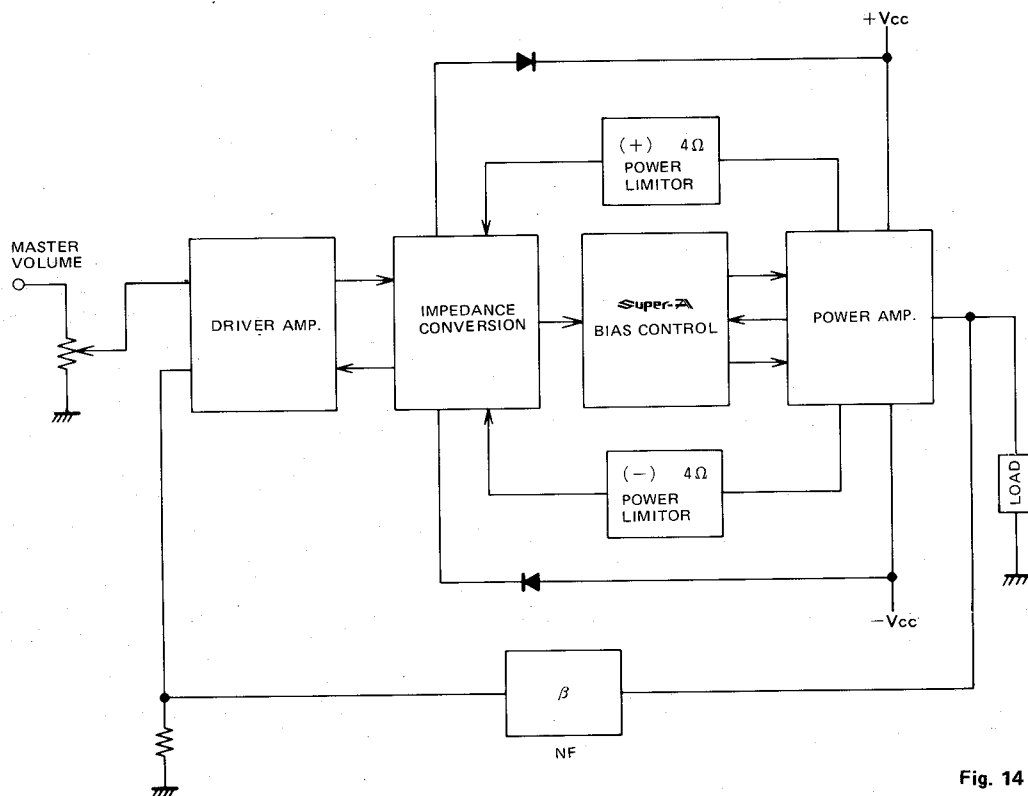


Fig. 14

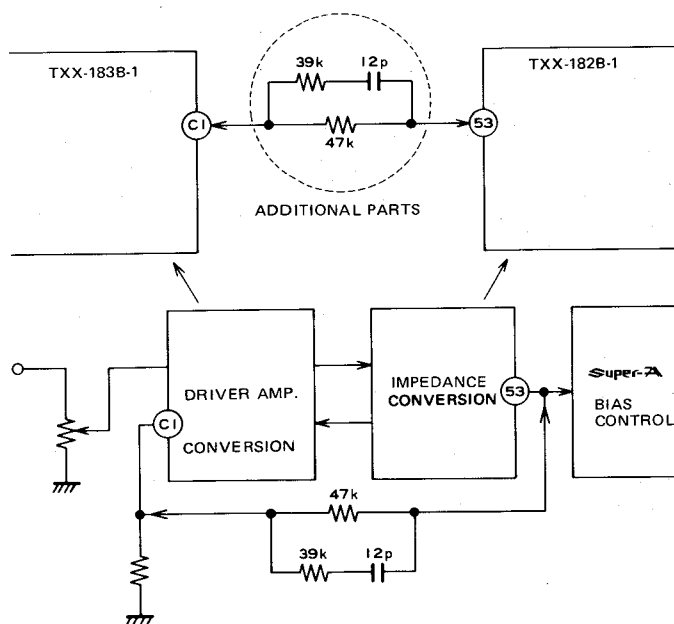
### 1. Troubleshooting

- 1) Separate the power amplification stage from the bias stage to check the stage with trouble.
  - (1) Remove one of the leads of resistors R437 (560  $\Omega$ ) and R439 (47  $\Omega$ ) to disconnect the bias stage from the power amplification stage.
  - (2) Connect the bases of X421 (2SC2229) and X423 (2SA949) through a resistor of approx. 1 k $\Omega$  so that DC bias current is not applied to the first stage of the power amplifier.
  - (3) Remove the power limiters X417 (2SC458) and X419 (2SA1029).
  - (4) Remove the overcurrent prevention diodes D401 and D403 (1SS81).
  - (5) Remove the 3-pin connector (3 pins 1, 2, 3 on the power amplifier circuit board TXX-182B-1) which is employed to provide feedback from the output stage to the first stage.

- (6) Remove one of the wires (the wire between S and S' on the circuit board TXX-182B-1) by which the output voltage is transmitted from the output center point to the Super A bias circuit.

**Note:** For the right channel, the wire with the same function as that between S and S' is jumper wire W417.

- (7) Mount the external parts shown in Fig. 15 to allow feedback, and set Subsonic and Tone switches to the OFF positions.



Method to allow the negative feedback in the bias circuit

Fig. 15

- (8) Remove the 3-pin connector (the connector is in the wiring connecting 23, 24, 25 on power amplifier circuit board TXX-183B-1 with the B coil of the transformer) with which the  $\pm B$  voltage is supplied to the power amplification stage. Set the power amplification stage in the non-operation stage.
- (9) Turn on the power. Measure the voltage between the collectors of X409 (2SA899) and X411 (2SC1904). Reduce the output volume to the minimum level to prevent an unnecessary input from being applied. Turn semi-fixed resistor R513 to adjust the bias current to check that the voltage variation is 3.5 – 4.7 V. If it is, the signal amplification circuit from the first stage to the Super A bias circuit is normal.  
In this measurement an error of 0.2 – 0.3 V is allowable. However, if the error exceeds 0.5 V, trouble exists with the circuit.  
As to polarity, the X409 (2SA899) side is positive and the X411 (2SC1904) side is negative.  
Be sure to fully turn R513 after the checking so that the measured voltage becomes minimum.
- 2) If there is no trouble prior to the bias stage as described in 1-(9), repair the power amplification stage. For repairing, refer to "5. Repairing the power amplification stage".
- 3) If trouble exists before the bias circuit output, perform repairing following the order of; Impedance conversion stage → Super A bias circuit stage as described in "2. Repairing the voltage amplification stage".

## 2. Repairing the voltage amplification stage

- 1) Prepare the additional parts to be mounted outside <refer to 1-1-(7)> and a wire to be employed for shorting.  
Mount as shown in Fig. 16.

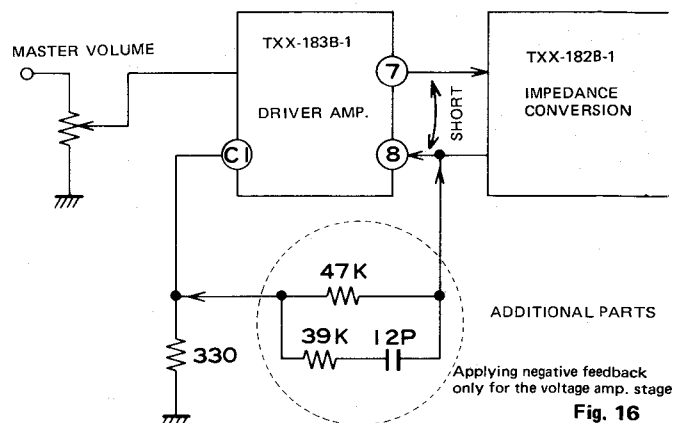


Fig. 16

- 2) Remove the 7-pin connector (pins 10 – 16 of the power amplifier circuit board TXX-182B-1) connecting the voltage amplification stage with the impedance conversion stage first. (A value of 0 V should be obtained by adjusting semi-fixed resistor R305.)
  - 3) Check if the offset voltage (the output voltage of the voltage amplification circuit TXX-183B-1 at pins 7 or 8) is correct.
  - 4) Turn the output volume control to the maximum position and read the gain and the maximum output level at the points mentioned above.  
Gain → 43 dB  $\pm$  1 dB  
Maximum output level → Approx. 40 V rms
  - 5) If the conditions in steps 3 and 4 are satisfied, this stage is normal.
- ### 3. Repairing the impedance conversion stage
- 1) Remove the shoring wire fitted in step 2-1. Refit the externally mounted parts for negative feedback to the original positions shown in 1-1-(7).
  - 2) Insert the connector which has been disconnected in step 2-2.
  - 3) Remove the connector Super A bias circuit board TAS-30A from the power amplifier circuit board TXX-182B-1.
  - 4) Check if the offset voltage can be properly adjusted at the output point (point 53 of TXX-182B-1) of the impedance conversion stage (0 V should be obtained by adjusting semi-fixed resistor R305).
  - 5) Check the gain and maximum output voltage at the same test point in the same way as with the voltage amplification stage.  
**Note:** Since no gain is available at the impedance conversion stage, the gain between the input and this stage is 43 dB.  
(The maximum output level becomes approx. 38 – 40 V rms due to some loss.)
  - 6) If the conditions in steps 4 and 5 are satisfied, operation between the input and this stage is normal.



#### 4. Repairing the Super A bias circuit

- 1) Insert the Super A bias circuit board TAS-30A into the specified position.
- 2) Repair the circuit until the conditions in 1-1-(9) become satisfactory.
- 3) Repairing hints
  - Check if a voltage  $1.8 - 2\text{ V}$  is available between the collectors and emitters of X413 and X415 (2SC458) of the battery circuit.
  - Check if the emitter voltage of X509 (2SC458) is lower than its base voltage by  $0.6 - 0.7\text{ V}$ .
  - Check if the emitter voltage of X511 (2SA1029) is higher than its base voltage by  $0.6 - 0.7\text{ V}$ .
  - Check if the voltage between the emitter and base of X505 (2SA1029) is almost the same as that between the base and emitter of X509 (2SA1029).
  - Check if the voltage between the collector and emitter of X507 (2SC458) is almost the same as that between the base and emitter of X511 (2SC458).
  - Check if the regulated current circuit of X409 (2SA899) and X411 (2SC1904) correctly provides the regulated current of approx.  $4\text{ mA}$ .  
**Note:** If a voltage of approx.  $4.8\text{ V}$  is present between the terminals of R419 and R421 ( $1.2\text{ k}\Omega$ ), a current of approx.  $4\text{ mA}$  is available at the emitters of X409 and X411.
  - Check if the regulated current circuit of X501 (2SA899) and X411 (2SC1904) correctly provides the regulated current of approx.  $8\text{ mA}$ .  
**Note:** If a voltage of approx.  $5\text{ V}$  is present between the terminals of R501 and R503 ( $680\Omega$ ), the circuit is operated normally as above.
  - Check if the Zener diode in the base bias circuit of the regulated power current transistor provides the correct voltage.  
**Note:** Trouble cannot be detected by merely checking the Zener diode resistance in the forward and backward directions, using a tester. Checking with a tester may not be effective to distinguish a usable Zener diode from a defective one (even the voltage is reduced by  $30 - 40$  percent).
  - Check if Schottky diodes D503 and D505 are not open or short-circuited.
  - Check if resistors R523 and R525 ( $47\Omega$ ) are not open due to being burnt out.
  - Check if a voltage variation of  $0.6 - 0.8\text{ V}$  ( $V_{BE} + 0.1\text{ V}$ ) is obtained between the collector of X505 (2SA1029) and the emitter of X507 (2SC458) by turning semi-fixed resistor R513 for bias adjustment. If the voltage variation is not obtained, also check the resistor itself.  
Be sure to fully turn the semi-fixed resistor counter-clockwise after adjustment.

#### 5. Repairing the power amplification stage

- 1) Repairing this stage is not so difficult. However, if the repairing is not complete, the expensive output transistors may be damaged again. Repair taking care of the following points.
  - Is R455 ( $68\Omega$   $1/2\text{ W}$ ) broken?
  - Is R455 ( $820\Omega$   $1/2\text{ W}$ ) burnt out? Is it open?
  - Are R411 and R443 ( $47\Omega$ ) burnt out? Are they open?
  - Are R437 ( $560\Omega$ ) and R439 ( $47\Omega$ ) burnt out? Are they open?

- 2) Before turning on the power be sure to confirm that the bases of X421 (2SC2229) and X243 (2SA949) are connected through a resistor of around  $1\text{ k}\Omega$ .
- 3) Checking when turning on the power
  - (1) Check that the voltage between the bases of X421 (2SC2229) and X423 (2SA949) and ground is  $0\text{ V}$  using a voltmeter (tester) having a low internal resistance.
  - (2) Check if the voltage between the base/emitter of all transistors comprising the Darlington circuit and ground is  $0\text{ V}$  using the same voltmeter as in (1).
- 4) Overall checking

After completion of repairing of each stage, put the checked sections back in their original states, except the power limiters and overcurrent prevention diodes.

  - Exercise care with the following.
    - Is the bias circuit board connected?
    - Is the resistor for idling current adjustment correctly set?
    - Are the resistors that were removed replaced?
    - Are the jumper wires that were removed replaced?
    - Are the parts that were externally mounted removed?
    - Are the connectors connected?

After confirming these points, turn on the power.

  - (1) Adjust the idling current and offset voltage referring to the section "Adjustment procedure".
  - (2) Check the maximum output voltage while the output level is gradually increased with the control with a load connected to the output terminals.
  - (3) Perform the checking of 2. through an  $8\Omega$  resistor.
  - (4) Perform the checking of 2. through a  $4\Omega$  resistor.
  - (5) After replacing power limiters X417 (2SC458) and X419 (2SA1029) in their original state, check if the non-clip output with a  $4\Omega$  resistor is less than  $19\text{ V}$  at  $1\text{ kHz}$ .
  - (6) After replacing diodes D401 and D403 (1SS81) in their original state, check that operation is correct.

## 7-(2) Indicators

#### 1. Indicator lamp circuit design

The circuit consists of 2 blocks; one comprises the 5 series connected lamps "POWER" — "TONE" and the other consists of the 7 series connected lamps "MUTING" — "MC". The lamps light with the regulated current from the 2 regulated current circuits with a common base circuit.

#### 2. Defective lamp phenomena and troubleshooting

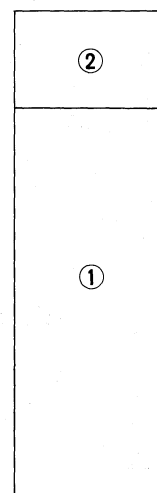
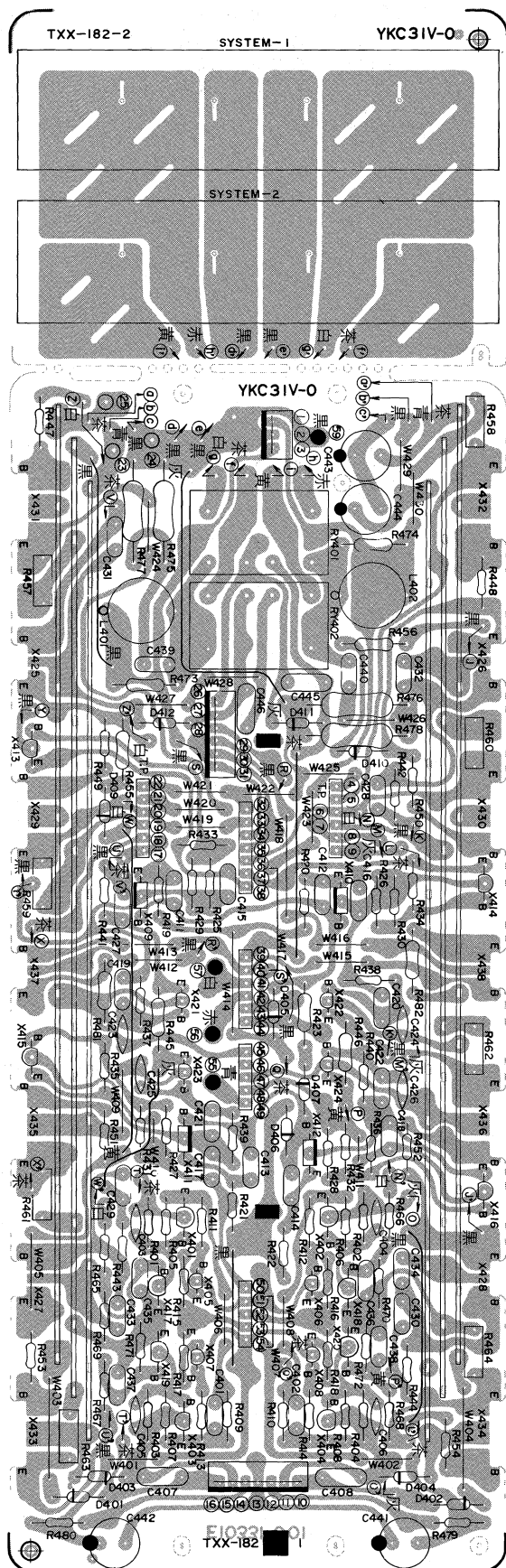
If a lamp is defective, not only all the lamps in the same block but lamps in the other block may not light. Consequently, if other lamps which have been lighting do not light when a switch is operated, the lamp related with the switch is defective.

(Example: If other lamps which have been lighting do not light when the AUX switch is pressed, it means that the AUX lamp is defective.

For the same reason, if the POWER indicator lamp is defective, other lamps do not light even when the power switch is turned on.)

## 8. Printed Circuit Board Ass'y and Parts List

### 8-(1) TXX-182B Power Amp. and Speaker Connector P.C. Board Ass'y



- ① TXX-182B-1: Power Amp. P.C. Board Ass'y
- ② TXX-182-2: Speaker Connector P.C. Board Ass'y

#### Note:

The specific symbols ( 赤・黒・白 ... etc.) on a surface of above P.C. Board are actually unrelated to the repair service and are significant denotement in order to process the proper assembly of P.C. Board at the factory.

Fig. 17

## Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT		Maker
X401	2SC2546(E)	0.4 W	90 MHz	Silicon	Hitachi
X402	2SC2546(E)	"	"	"	"
X403	2SA1084(E)	"	"	"	"
X404	2SA1084(E)	"	"	"	"
X405	2SC2229(Y)	0.8 W	120 MHz	"	Toshiba
X406	2SC2229(Y)	"	"	"	"
X407	2SA949(Y)	"	"	"	"
X408	2SA949(Y)	"	"	"	"
X409	2SA899(B)	1 W	100 MHz	"	Fujitsu
X410	2SA899(B)	"	"	"	"
X411	2SC1904(B)	"	130 MHz	"	"
X412	2SC1904(B)	"	"	"	"
X413	2SC458(C)	0.2 W	230 MHz	"	Hitachi
X414	2SC458(C)	"	"	"	"
X415	2SC458(C)	"	"	"	"
X416	2SC458(C)	"	"	"	"
X417	2SC458(C)	"	"	"	"
X418	2SC458(C)	"	"	"	"
X419	2SA1029(C)	"	280 MHz	"	"
X420	2SA1029(C)	"	"	"	"
X421	2SC2229(Y)	0.8 W	120 MHz	"	Toshiba
X422	2SC2229(Y)	"	"	"	"
X423	2SA949(Y)	"	"	"	"
X424	2SA949(Y)	"	"	"	"
X425	2SD381(M)	20 W	45 MHz	"	NEC
X426	2SD381(M)	"	"	"	"
X427	2SB536(M)	"	40 MHz	"	"
X428	2SB536(M)	"	"	"	"
X429	2SC2525(G,B)	120 W	80 MHz	"	Fujitsu
X430	2SC2525(G,B)	"	"	"	"
X431	2SC2525(G,B)	"	"	"	"
X432	2SC2525(G,B)	"	"	"	"
X433	2SA1075(G,B)	"	60 MHz	"	"
X434	2SA1075(G,B)	"	"	"	"
X435	2SA1075(G,B)	"	"	"	"
X436	2SA1075(G,B)	"	"	"	"
X437	2SB507V(E)	30 W	8 MHz	"	Sanyo
X438	2SB507V(E)	"	"	"	"

## Capacitors

Item No.	Part Number	Rating		Description
C401	QFM31HK-333	0.033 $\mu$ F	50 V	Mylar
C402	QFM31HK-333	"	"	"
C403	QCS21HJ-560	56 pF	"	Ceramic
C404	QCS21HJ-560	"	"	"
C405	QCS21HJ-560	"	"	"
C406	QCS21HJ-560	"	"	"
C407	QFP31HJ-333	0.033 $\mu$ F	"	Polypropylene
C408	QFP31HJ-333	"	"	"
C415	QFM32AJ-333	"	100 V	Mylar
C416	QFM32AJ-333	"	"	"
C417	QFM32AJ-333	"	"	"
C418	QFM32AJ-333	"	"	"
C419	QFP31HJ-181	180 pF	50 V	Polypropylene
C420	QFP31HJ-181	"	"	"
C421	QFP31HJ-391	390 pF	"	"
C422	QFP31HJ-391	"	"	"
C423	QCS22HJ-330	33 pF	500 V	Ceramic
C424	QCS22HJ-330	"	"	"
C425	QCS22HJ-330	"	"	"
C426	QCS22HJ-330	"	"	"
C427	QFP31HJ-471	470 pF	50 V	Polypropylene
C428	QFP31HJ-471	"	"	"
C429	QFP31HJ-471	"	"	"
C430	QFP31HJ-471	"	"	"
C431	QFP32AJ-101	100 pF	100 V	"
C432	QFP32AJ-101	"	"	"
C433	QFP32AJ-101	"	"	"
C434	QFP32AJ-101	"	"	"
C435	QFM31HK-333	0.033 $\mu$ F	50 V	Mylar
C436	QFM31HK-333	"	"	"
C437	QFM31HK-333	"	"	"
C438	QFM31HK-333	"	"	"
C439	QFM32AJ-333	"	100 V	"
C440	QFM32AJ-333	"	"	"
C443	QET52AR-476	47 $\mu$ F	"	Electrolytic
C444	QET52AR-476	"	"	"
C445	QFM31HJ-563	0.056 $\mu$ F	50 V	Mylar
C446	QFM31HJ-563	"	"	"

## Diodes

Item No.	Part Number	Rating	Description	Maker
D401	1SS81		Silicon	Hitachi
D402	1SS81		"	"
D403	1SS81		"	"
D404	1SS81		"	"
D405	RD5,6EC		"	NEC
D406	RD5,6EC		"	"
D407	WZ-280		Silicon	JRC
D409	1S2076-31		"	Hitachi
D410	1S2076-31		"	"
D411	1S2076-31		"	"
D412	1S2076-31		"	"

## Coils

Item No.	Part Number	Rating	Description
L401	E04059-1R2B		
L402	E04059-1R2B		

## Resistors

Item No.	Part Number	Rating		Description
R401	QRD141J-822S	8.2 k $\Omega$	1/4 W	Carbon
R402	QRD141J-822S	"	"	"
R403	QRD141J-822S	"	"	"
R404	QRD141J-822S	"	"	"
R405	QRD141J-102S	1 k $\Omega$	"	"
R406	QRD141J-102S	"	"	"
R407	QRD141J-102S	"	"	"
R408	QRD141J-102S	"	"	"
R409	QRD149J-151S	150 $\Omega$	"	"
R410	QRD149J-151S	"	"	"
R411	QRD149J-101S	100 $\Omega$	"	"
R412	QRD149J-101S	"	"	"
R413	QRD149J-101S	"	"	"
R414	QRD149J-101S	"	"	"
R415	QRD149J-470S	47 $\Omega$	"	"
R416	QRD149J-470S	"	"	"
R417	QRD149J-470S	"	"	"
R418	QRD149J-470S	"	"	"
R419	QRD141J-122S	1.2 k $\Omega$	"	"
R420	QRD141J-122S	"	"	"

## Resistors

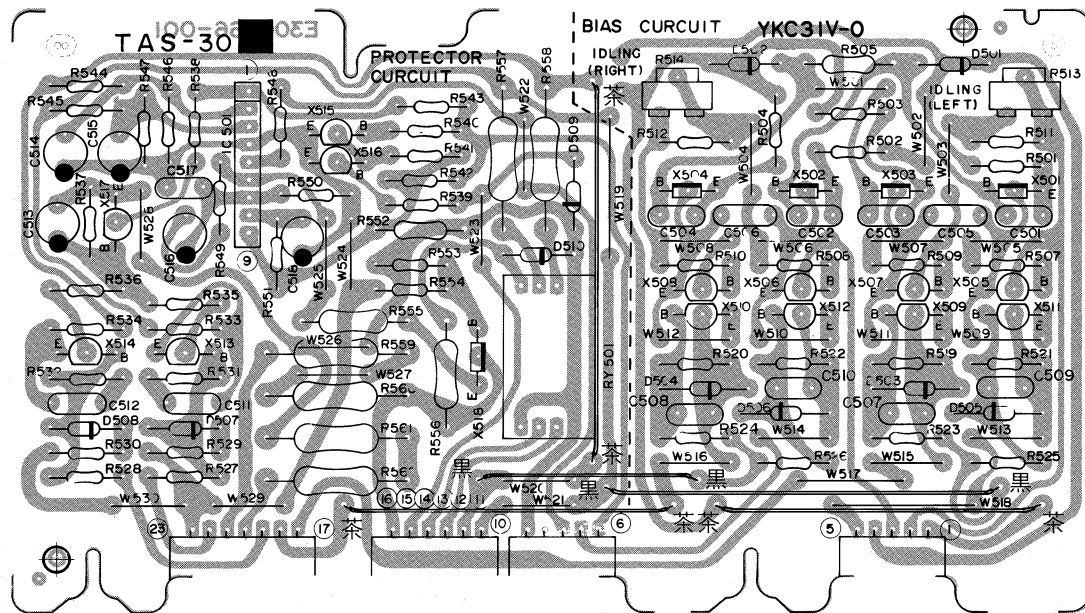
Item No.	Part Number	Rating	Description
R421	QRD141J-122S	1.2 k $\Omega$	1/4 W Carbon
R422	QRD141J-122S	"	"
R423	QRD129J-393	39 k $\Omega$	1/2 W "
R425	QRD141J-621S	620 $\Omega$	1/4 W "
R426	QRD141J-621S	"	"
R427	QRD141J-621S	"	"
R428	QRD141J-621S	"	"
R433	QRD141J-331S	330 $\Omega$	"
R434	QRD141J-331S	"	"
R435	QRD141J-331S	"	"
R436	QRD141J-331S	"	"
R437	QRD149J-561S	560 $\Omega$	"
R438	QRD149J-561S	"	"
R439	QRD149J-470S	47 $\Omega$	"
R440	QRD149J-470S	"	"
R441	QRD149J-470S	"	"
R442	QRD149J-470S	"	"
R443	QRD149J-470S	"	"
R444	QRD149J-470S	"	"
R445	QRD129J-821	820 $\Omega$	1/2 W "
R446	QRD129J-821	"	"
R447	QRD149J-5R6S	5.6 $\Omega$	1/4 W "
R448	QRD149J-5R6S	"	"
R449	QRD149J-5R6S	"	"
R450	QRD149J-5R6S	"	"
R451	QRD149J-5R6S	"	"
R452	QRD149J-5R6S	"	"
R453	QRD149J-5R6S	"	"
R454	QRD149J-5R6S	"	"
R455	QRD129J-680	68 $\Omega$	1/2 W "
R456	QRD129J-680	"	"
R457	QRM054K-R47	0.47 $\Omega$	5 W Metal Plate
R458	QRM054K-R47	"	"
R459	QRM054K-R47	"	"
R460	QRM054K-R47	"	"
R461	QRM054K-R47	"	"
R462	QRM054K-R47	"	"
R463	QRM054K-R47	"	"
R464	QRM054K-R47	"	"
R465	QRD149J-391S	390 $\Omega$	1/4 W Carbon
R466	QRD149J-391S	"	"
R467	QRD149J-391S	"	"
R468	QRD149J-391S	"	"
R469	QRD149J-241S	240 $\Omega$	"
R470	QRD149J-241S	"	"
R471	QRD149J-241S	"	"
R472	QRD149J-241S	"	"
R473	QRD129J-270	27 $\Omega$	1/2 W "
R474	QRD129J-270	"	"
R475	QRZ0049-100	10 $\Omega$	1 W Fusible
R476	QRZ0049-100	"	"
R477	QRZ0049-100	"	"
R478	QRZ0049-100	"	"
R481	QRD129J-151	150 $\Omega$	1/2 W Carbon
R482	QRD129J-151	"	"

Item No.	Part Number	Description
±B NF	G-746S,G,R EWS053-004 QMV5005-003 E03799	Silicon Grease Socket Wire Ass'y 3P Plug Ass'y Insulator Bushing, For 2SB507
	1S-313	Insulator Film, For 2SB507
CHECK P.C.B. P.C.B. P.C.B.	E03800	Insulator Bushing, For 2SD381, 2SB536
	E03801	Insulator Film, For 2SD381, 2SB536
	E03686-006F	Plug Ass'y
	E03686-005F	"
P.C.B.	E03686-005F	"
P.C.B.	E03686-006F	"
P.C.B.	E03686-007F	"
RELAY	QMV5005-006	6P Plug Ass'y
RY401	ESK6D24-212	Relay Switch
SIGNA	QMV5005-007	7P Plug Ass'y

## Others

Item No.	Part Number	Rating	Description
	E03572-011		Speaker Terminal
	E03798-001		Bus Bar
	E300064-001		Heat Sink Bracket
	E300186-001		Heat Sink
	E66533-001		L-Bracket

## 8-(2) TAS-30A Bias Control and Protector P.C. Board Ass'y



**Fig. 18**

## Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT	Silicon	Maker
X501	2SA899(B)	1 W	100 MHz		Fujitsu
X502	2SA899(B)	"	"	"	"
X503	2SC1904(B)	"	130 MHz	"	"
X504	2SC1904(B)	"	"	"	"
X505	2SA1029(C)	0.2 W	280 MHz	"	Hitachi
X506	2SA1029(C)	"	"	"	"
X507	2SC458(C)	"	230 MHz	"	"
X508	2SC458(C)	"	"	"	"
X509	2SC458(C)	"	"	"	"
X511	2SA1029(C)	"	280 MHz	"	"
X512	2SA1029(C)	"	"	"	"
X513	2SC1775AV(F)	0.3 W	200 MHz	"	"
X514	2SC1775AV(F)	"	"	"	"
X515	2SC1775AV(F)	"	"	"	"
X516	2SC1775AV(F)	"	"	"	"
X517	2SA872AV(E)	"	120 MHz	"	"
X518	2SD669A(C)	1 W	140 MHz	"	"

Item No.	Part Number	Rating		Description
C506	QFM32AJ-393	0.039 $\mu$ F	100 V	Mylar
C507	QFP32AJ-121	120 pF	"	Polypropylene
C508	QFP32AJ-121	"	"	"
C509	QFP32AJ-121	"	"	"
C510	QFP32AJ-121	"	"	"
C511	QFM31HJ-104	0.1 $\mu$ F	50 V	Mylar
C512	QFM31HJ-104	"	"	"
C513	QET51CR-226	22 $\mu$ F	16 V	Electrolytic
C514	QET51AR-476	47 $\mu$ F	10 V	"
C515	QET51AR-476	"	"	"
C516	QET51HR-474	0.47 $\mu$ F	50 V	"
C517	QFM31HJ-153	0.015 $\mu$ F	"	Mylar
C518	QET51CR-226	22 $\mu$ F	16 V	Electrolytic

## Integrated Circuits

Item No.	Part Number	Rating	Description	
IC501	TA7317P	Pc 0.5 W	I.C.	Maker Toshiba

## Diodes

Item No.	Part Number	Rating	Description	Maker
D501	RD5,6EC		Silicon	NEC
D502	RD5,6EC		"	"
D503	1S1925		"	JRC
D504	1S1925		"	"
D505	1S1925		"	"
D506	1S1925		"	"
D507	1SS81		"	Hitachi
D508	1SS81		"	"
D509	RD5,6EC		"	NEC
D510	1S2076-31		"	Hitachi

## Capacitors

Item No.	Part Number	Rating	Description
C501	QFM31HJ-333	0.033 $\mu$ F 50 V	Mylar
C502	QFM31HJ-333	" "	"
C503	QFM31HJ-333	" "	"
C504	QFM31HJ-333	" "	"
C505	QFM32AJ-393	0.039 $\mu$ F 100 V	"

## Resistors

Item No.	Part Number	Rating	Description
R501	QRD149J-681S	680 $\Omega$ 1/4 W	Carbon
R502	QRD149J-681S	" "	"
R503	QRD149J-681S	" "	"
R504	QRD149J-681S	" "	"
R505	QRD129J-563	56 k $\Omega$ 1/2 W	"
R511	QRD149J-330S	33 $\Omega$ 1/4 W	"
R512	QRD149J-330S	" "	"
R513	QVP9A0B-101	100 $\Omega$ 0.15 W	Variable (Metal)
R514	QVP9A0B-101	" "	"
R519	QRD141J-103S	10 k $\Omega$ 1/4 W	Carbon
R520	QRD141J-103S	" "	"
R521	QRD141J-103S	" "	"
R522	QRD141J-103S	" "	"
R523	QRD149J-471S	470 $\Omega$ "	"
R524	QRD149J-471S	" "	"
R525	QRD149J-471S	" "	"
R526	QRD149J-471S	" "	"
R527	QRD141J-681S	680 $\Omega$ "	"
R528	QRD141J-681S	" "	"
R529	QRD141J-562S	5.6 k $\Omega$ "	"
R530	QRD141J-562S	" "	"
R531	QRD141J-101S	100 $\Omega$ "	"
R532	QRD141J-101S	" "	"
R533	QRD141J-471S	470 $\Omega$ "	"
R534	QRD141J-471S	" "	"

## Resistors

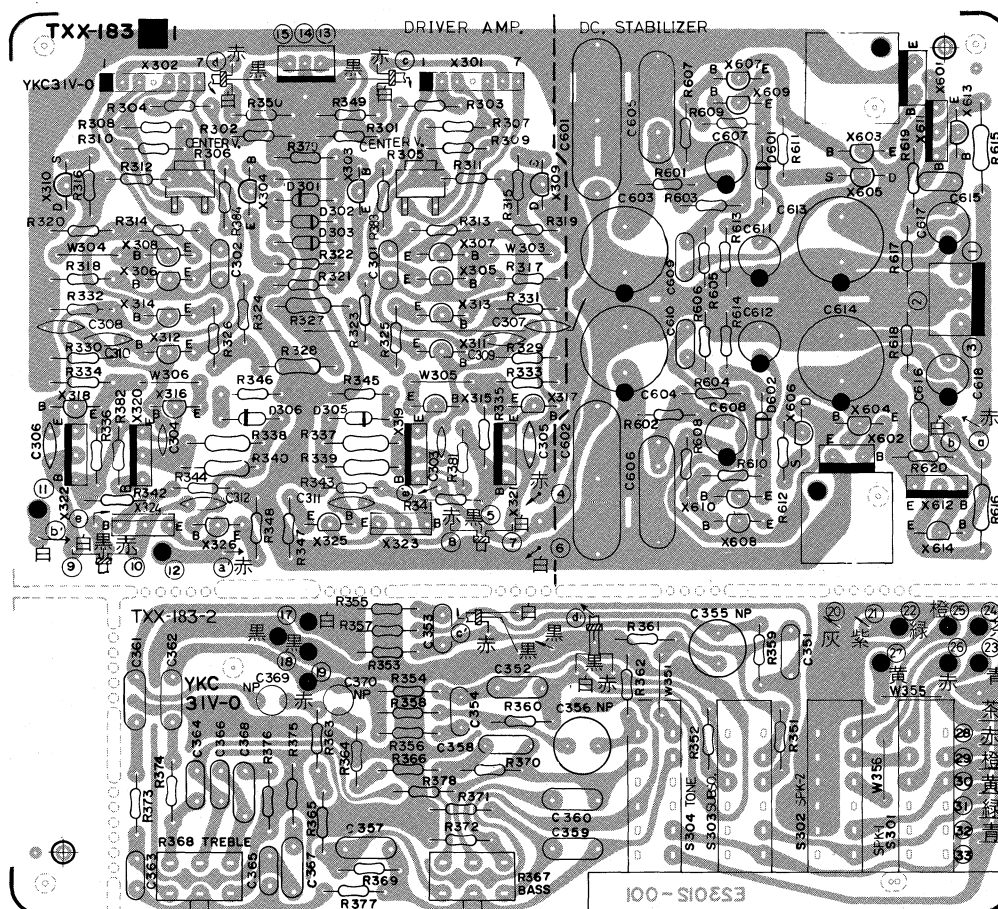
Item No.	Part Number	Rating		Description
R535	QRD141J-123S	12 k $\Omega$	1/4 W	Carbon
R536	QRD141J-123S	"	"	"
R537	QRD141J-103S	10 k $\Omega$	"	"
R538	QRD141J-563S	56 k $\Omega$	"	"
R539	QRD141J-223S	22 k $\Omega$	"	"
R540	QRD141J-103S	10 k $\Omega$	"	"
R541	QRD141J-103S	"	"	"
R542	QRD141J-683S	68 k $\Omega$	"	"
R543	QRD141J-103S	10 k $\Omega$	"	"
R544	QRD141J-563S	56 k $\Omega$	"	"
R545	QRD141J-563S	"	"	"
R546	QRD141J-203S	20 k $\Omega$	"	"
R547	QRD141J-203S	"	"	"
R548	QRD141J-273S	27 k $\Omega$	"	"
R549	QRD141J-563S	56 k $\Omega$	"	"
R550	QRD141J-333S	33 k $\Omega$	"	"
R551	QRD141J-334S	330 k $\Omega$	"	"
R552	QRD129J-183	18 k $\Omega$	1/2 W	"
R553	QRD141J-223S	22 k $\Omega$	1/4 W	"
R554	QRD141J-822S	8.2 k $\Omega$	"	"

Item No.	Part Number	Rating		Description
R555	QRG017J-331S	330 $\Omega$	1 W	Oxide Metal Film
R556	QRG017J-392S	3.9 k $\Omega$	"	"
R557	QRG027J-331	330 $\Omega$	2 W	"
R558	QRG027J-331	"	"	"
R559	QRG027J-471	470 $\Omega$	"	"
R560	QRG027J-471	"	"	"
R561	QRG027J-471	"	"	"
R562	QRG027J-471	"	"	"

## Others

Item No.	Part Number	Rating	Description
	E03708-005A		Connector
	E03708-005A		"
	E03708-006A		"
	E03708-007A		"
RY501	ESK2D24-213		Relay Switch

## 8-(3) TXX-183B Driver Amp. and Tone Control P.C.Board Ass'y



## Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT	Silicon	Maker
X301	2SK150A(GR)	0.2 W/ Unit		Silicon	Toshiba
X302	2SK150A(GR)	"		"	"
X303	2SC2546(E)	0.4 W	90 MHz	"	Hitachi
X304	2SC2546(E)	0.4 W	90 MHz	"	"
X305	2SC1775AV(F)	0.3 W	200 MHz	"	"
X306	2SC1775AV(F)	"	"	"	"
X307	2SC1775AV(F)	"	"	"	"
X308	2SC1775AV(F)	"	"	"	"
X309	2SK105(F)	0.25 W		"	NEC
X310	2SK105(F)	"		"	"
X311	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X312	2SC1775AV(F)	"	"	"	"
X313	2SC1775AV(F)	"	"	"	"
X314	2SC1775AV(F)	"	"	"	"
X315	2SA1029(C)	0.2 W	280 MHz	"	"
X316	2SA1029(C)	"	"	"	"
X317	2SA1029(C)	"	"	"	"
X318	2SA1029(C)	"	"	"	"
X319	2SA899(B)	1 W	100 MHz	"	Fujitsu
X320	2SA899(B)	"	"	"	"
X321	2SA899(B)	"	"	"	"
X322	2SA899(B)	"	"	"	"
X323	2SC1904(B)	"	130 MHz	"	"
X324	2SC1904(B)	"	"	"	"
X325	2SC458(C)	0.2 W	230 MHz	"	Hitachi
X326	2SC458(C)	"	"	"	"
X601	2SD313V(E)	30 W	8 MHz	"	Sanyo
X602	2SB507V(E)	"	"	"	"
X603	2SC2546(E)	0.4 W	90 MHz	"	Hitachi
X604	2SA1084(E)	"	"	"	"
X605	2SK105(F)	0.25 W		"	NEC
X606	2SK105(F)	"		"	"
X607	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X608	2SA872AV(E)	"	120 MHz	"	"
X609	2SC1775AV(F)	"	200 MHz	"	"
X610	2SA872AV(E)	"	120 MHz	"	"
X611	2SB649A(C)	1 W	140 MHz	"	"
X612	2SD669A(C)	"	"	"	"
X613	2SC2546(E)	0.4 W	90 MHz	"	"
X614	2SA1084(E)	"	"	"	"

Item No.	Part Number	Rating		Description
C306	QCS22HJ-150	15 pF	500 V	Ceramic
C307	QCS21HJ-150	"	50 V	"
C308	QCS21HJ-150	"	"	"
C309	QCS21HJ-8R0	8 pF	"	"
C310	QCS21HJ-8R0	"	"	"
C311	QCS22HJ-120	12 pF	500 V	"
C312	QCS22HJ-120	"	"	"
C351	QFM31HJ-474	0.47 $\mu$ F	50 V	Mylar
C352	QFM31HJ-474	"	"	"
C353	QFS22HK-120	12 pF	500 V	Polystyrol
C354	QFS22HK-120	"	"	"
C355	QEZ0046-226	22 $\mu$ F	50 V	Electrolytic
C356	QEZ0046-226	"	"	"
C357	QFM31HJ-393	0.039 $\mu$ F	"	Mylar
C358	QFM31HJ-393	"	"	"
C359	QFM31HJ-274	0.27 $\mu$ F	"	"
C360	QFM31HJ-274	"	"	"
C361	QFP31HJ-752	7500 pF	"	Polypropylene
C362	QFP31HJ-752	"	"	"
C363	QFP31HJ-181	180 pF	"	"
C364	QFP31HJ-181	"	"	"
C365	QFM31HJ-122	1200 pF	"	Mylar
C366	QFM31HJ-122	"	"	"
C367	QFM31HJ-563	0.056 $\mu$ F	"	"
C368	QFM31HJ-563	"	"	"
C369	QEZ0046-225	2.2 $\mu$ F	"	Electrolytic
C370	QEZ0046-225	"	"	"
C603	QET51JR-477H	470 $\mu$ F	63 V	"
C604	QET51JR-477H	"	"	"
C607	QET51JR-476H	47 $\mu$ F	"	"
C608	QET51JR-476H	"	"	"
C609	QCS21HJ-390	39 pF	50 V	Ceramic
C610	QCS21HJ-390	"	"	"
C611	QET51CR-107H	100 $\mu$ F	16 V	Electrolytic
C612	QET51CR-107H	"	"	"
C613	QET52AR-477E	470 $\mu$ F	100 V	"
C614	QET52AR-477E	"	"	"
C615	QFM31HJ-332	3300 pF	50 V	Mylar
C616	QFM31HJ-332	"	"	"
C617	QET52AR-476H	47 $\mu$ F	100 V	Electrolytic
C618	QET52AR-476H	"	"	"

## Diodes

Item No.	Part Number	Rating	Description	
			Silicon	Maker
D301	1S2076-32		Silicon	Hitachi
D302	1S2076-32		"	"
D303	WZ-061		"	S. Nihon Musen
D305	1S2076-32		"	Hitachi
D306	1S2076-32		"	"
D601	XZ-132		"	JRC
D602	XZ-132		"	"

## Resistors

Item No.	Part Number	Rating		Description
R301	QRD141J-224S	220 k $\Omega$	1/4 W	Carbon
R302	QRD141J-224S	"	"	"
R303	QRD141J-151S	150 $\Omega$	"	"
R304	QRD141J-151S	"	"	"
R305	QVP9A0B-101	100 $\Omega$	0.15 W	Variable (Metal)
R306	QVP9A0B-101	"	"	"
R307	QRD141J-220S	22 $\Omega$	1/4 W	Carbon
R308	QRD141J-220S	"	"	"
R309	QRD141J-220S	"	"	"
R310	QRD141J-220S	"	"	"
R311	QRD141J-153S	15 k $\Omega$	"	"
R312	QRD141J-153S	"	"	"
R313	QRD141J-561S	560 $\Omega$	"	"
R314	QRD141J-561S	"	"	"
R315	QRD141J-102S	1 k $\Omega$	"	"
R316	QRD141J-102S	"	"	"
R317	QRD141J-133S	13 k $\Omega$	"	"
R318	QRD141J-133S	"	"	"
R319	QRD141J-133S	"	"	"
R320	QRD141J-133S	"	"	"

## Capacitors

Item No.	Part Number	Rating		Description
C301	QFP31HJ-272	2700 pF	50 V	Polypropylene
C302	QFP31HJ-272	"	"	"
C303	QCS22HJ-150	15 pF	500 V	Ceramic
C304	QCS22HJ-150	"	"	"
C305	QCS22HJ-150	"	"	"



## Resistors

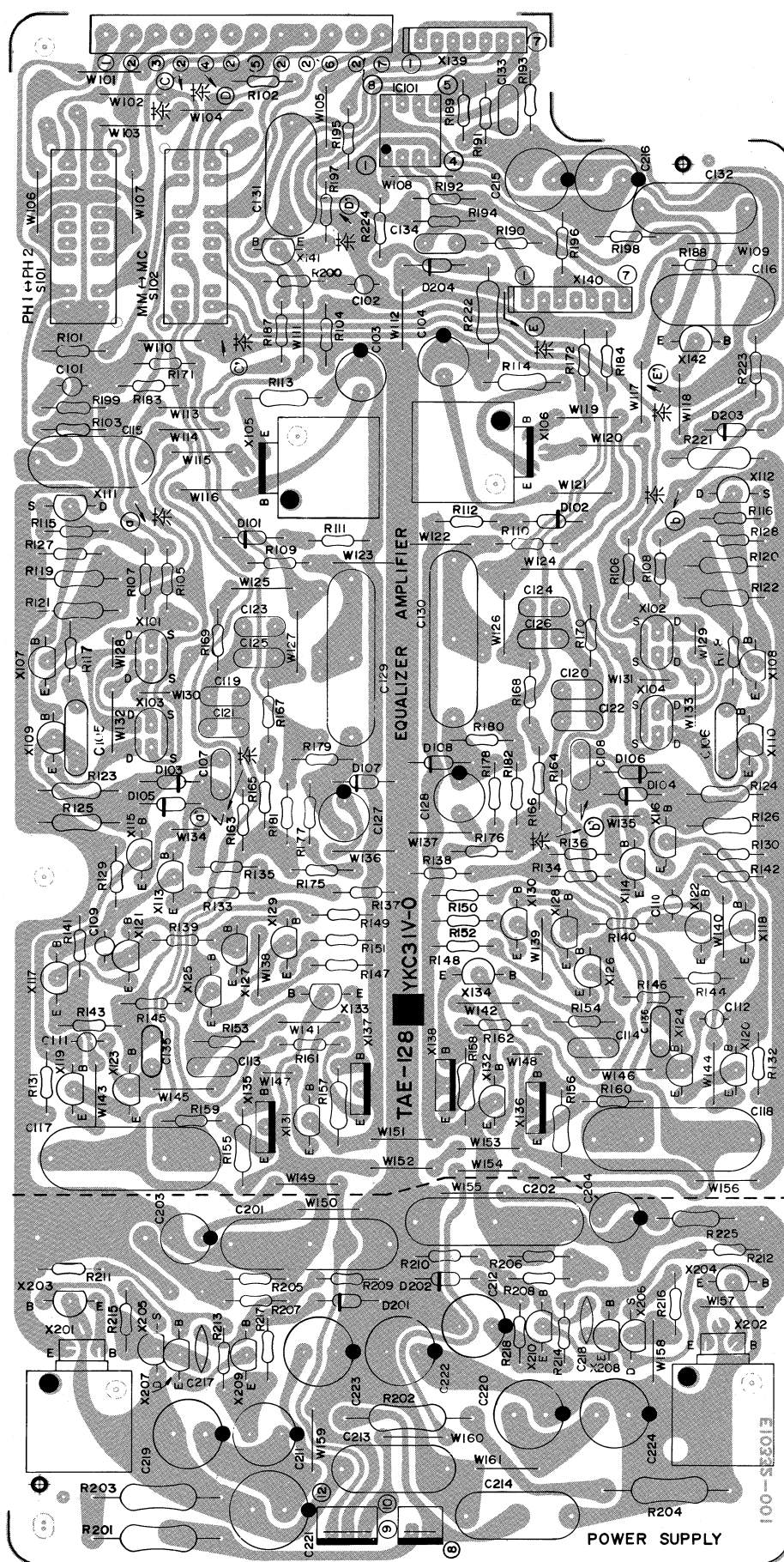
Item No.	Part Number	Rating		Description
R321	QRD141J-272S	2.7 kΩ	1/4 W	Carbon
R322	QRD141J-272S	"	"	"
R323	QRD141J-101S	100 Ω	"	"
R324	QRD141J-101S	"	"	"
R325	QRD141J-101S	"	"	"
R326	QRD141J-101S	"	"	"
R327	QRD129J-103	10 kΩ	1/2 W	"
R328	QRD129J-103	"	"	"
R329	QRD149J-102S	1 kΩ	1/4 W	"
R330	QRD149J-102S	"	"	"
R331	QRD149J-102S	"	"	"
R332	QRD149J-102S	"	"	"
R333	QRD149J-680S	68 Ω	"	"
R334	QRD149J-680S	"	"	"
R335	QRD141J-182S	1.8 kΩ	"	"
R336	QRD141J-182S	"	"	"
R337	QRD129J-103	10 kΩ	1/2 W	"
R338	QRD129J-103	"	"	"
R339	QRD129J-103	"	"	"
R340	QRD129J-103	"	"	"
R341	QRD141J-823S	82 kΩ	1/4 W	"
R342	QRD141J-823S	"	"	"
R343	QRD141J-222S	2.2 kΩ	"	"
R344	QRD141J-222S	"	"	"
R345	QRD149J-151S	150 Ω	"	"
R346	QRD149J-151S	"	"	"
R347	QRD149J-151S	"	"	"
R348	QRD149J-151S	"	"	"
R349	QRD141J-331S	330 Ω	"	"
R350	QRD141J-331S	"	"	"
R351	QRD141J-105S	1 MΩ	"	"
R352	QRD141J-105S	"	"	"
R353	QRD141J-275S	2.7 MΩ	"	"
R354	QRD141J-275S	"	"	"
R355	QRD141J-393S	39 kΩ	"	"
R356	QRD141J-393S	"	"	"
R357	QRD141J-393S	"	"	"
R358	QRD141J-393S	"	"	"
R359	QRD141J-622S	6.2 kΩ	"	"
R360	QRD141J-622S	"	"	"
R361	QRD141J-563S	56 kΩ	"	"
R362	QRD141J-563S	"	"	"
R363	QRD141J-471S	470 Ω	"	"
R364	QRD141J-471S	"	"	"
R365	QRD141J-822S	8.2 kΩ	"	"
R366	QRD141J-822S	"	"	"
R367	QVZ1709-007	50 kΩ	"	Variable (Carbon) BASS
R368	QVZ1709-008	"	"	" TREBLE
R369	QRD141J-914S	910 kΩ	"	Carbon
R370	QRD141J-914S	"	"	"
R371	QRD141J-132S	1.3 kΩ	"	"
R372	QRD141J-132S	"	"	"
R373	QRD141J-202S	2 kΩ	"	"
R374	QRD141J-202S	"	"	"
R375	QRD141J-301S	300 Ω	"	"
R376	QRD141J-301S	"	"	"
R377	QRD141J-620S	62 Ω	"	"
R378	QRD141J-620S	"	"	"
R379	QRD141J-183S	18 kΩ	"	"
R381	QRD149J-331S	330 Ω	"	"
R382	QRD149J-331S	"	"	"
R383	QRD141J-272S	2.7 kΩ	"	"
R384	QRD141J-272S	"	"	"
R601	QRD141J-123S	12 kΩ	"	"
R602	QRD141J-123S	"	"	"

Item No.	Part Number	Rating		Description
R603	QRD141J-472S	4.7 kΩ	1/4 W	Carbon
R604	QRD141J-472S	"	"	"
R605	QRD141J-562S	5.6 kΩ	"	"
R606	QRD141J-562S	"	"	"
R607	QRD141J-562S	"	"	"
R608	QRD141J-562S	"	"	"
R609	QRD141J-562S	"	"	"
R610	QRD141J-562S	"	"	"
R611	QRD141J-471S	470 Ω	"	"
R612	QRD141J-471S	"	"	"
R613	QRD141J-100S	10 Ω	"	"
R614	QRD141J-100S	"	"	"
R615	QRZ0050-150	15 Ω	1/2 W	Fusible
R616	QRZ0050-150	"	"	"
R617	QRD141J-334S	330 kΩ	1/4 W	Carbon
R618	QRD141J-334S	"	"	"
R619	QRD149J-223S	22 kΩ	"	"
R620	QRD149J-223S	"	"	"

## Others

Item No.	Part Number	Rating	Description
NF	E61537-001		Heat Sink
3P	EWS013-005		Socket Wire Ass'y
3P	E03782-003A		Plug
EQ. B	QMV5005-003		3P Plug Ass'y
	EWS012-002		Socket Wire Ass'y
IND.	EWS016-006		"
4 KEY	QSP0240-009		Push Switch
RELAY	EWS016-003		Socket Wire Ass'y
SIGNA	EWS017-003		"
LAMP	EWS012-001		"

### 8-(4) TAE-128B Equalizer Amp. P.C. Board Ass'y



**Note:** The specific symbols ( 赤, 黒, 白 ... etc.) on a surface of above P.C. Board are actually unrelated to the repair service and are significant denotement in order to process the proper assembly of P.C. Board at the factory.

**Fig. 20**

### Transistors

Item No.	Part Number	Rating		Description	
		Pc	fT	Silicon	Maker
X101	2SK146	0.6 W/ unit		Silicon	Toshiba
X102	2SK146	"		"	"
X103	2SK146	"		"	"
X104	2SK146	"		"	"
X105	2SD669A(C)	1 W	140 MHz	"	Hitachi
X106	2SD669A(C)	"	"	"	"
X107	2SC2546(E)	0.4 W	90 MHz	"	"
X108	2SC2546(E)	"	"	"	"
X109	2SC2546(E)	"	"	"	"
X110	2SC2546(E)	"	"	"	"
X111	2SK105(F)	0.25 W		"	NEC
X112	2SK105(F)	"		"	"
X113	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X114	2SC1775AV(F)	"	"	"	"
X115	2SC1775AV(F)	"	"	"	"
X116	2SC1775AV(F)	"	"	"	"
X117	2SA1029(C)	0.2 W	280 MHz	"	"
X118	2SA1029(C)	"	"	"	"
X119	2SA1029(C)	"	"	"	"
X120	2SA1029(C)	"	"	"	"
X121	2SA1084(E)	0.4 W	90 MHz	"	"
X122	2SA1084(E)	"	"	"	"
X123	2SA1084(E)	"	"	"	"
X124	2SA1084(E)	"	"	"	"
X125	2SC2546(E)	"	"	"	"
X126	2SC2546(E)	"	"	"	"
X127	2SC458(C)	0.2 W	230 MHz	"	"
X128	2SC458(C)	"	"	"	"
X129	2SC458(C)	"	"	"	"
X130	2SC458(C)	"	"	"	"
X131	2SA1084(E)	0.4 W	90 MHz	"	"
X132	2SA1084(E)	"	"	"	"
X133	2SC2546(E)	"	"	"	"
X134	2SC2546(E)	"	"	"	"
X135	2SD669A(C)	1 W	140 MHz	"	"
X136	2SD669A(C)	"	"	"	"
X137	2SB649A(C)	"	"	"	"
X138	2SB649A(C)	"	"	"	"
X139	2SK150A(GR)	0.2 W/ unit		"	Toshiba
X140	2SK150A(GR)	"		"	"
X141	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X142	2SC1775AV(F)	"	"	"	"
X201	2SD313V(E)	30 W	8 MHz	"	Sanyo
X202	2SB507V(E)	"	"	"	"
X203	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X204	2SA872AV(E)	"	120 MHz	"	"
X205	2SK105(F)	0.25 W		"	NEC
X206	2SK105(F)	"		"	"
X207	2SC1775AV(F)	0.3 W	200 MHz	"	Hitachi
X208	2SA872AV(E)	"	120 MHz	"	"
X209	2SC1775AV(F)	"	200 MHz	"	"
X210	2SA872AV(E)	"	120 MHz	"	"

### Integrated Circuits

Item No.	Part Number	Rating		Description	Maker
		Pc			
IC101	NJM4558D	0.5 W		I.C.	JRC

### Diodes

Item No.	Part Number	Rating	Description	Maker
D101	WZ-090A		Silicon	JRC
D102	WZ-090A		"	"
D103	1S2076-31		"	Hitachi
D104	1S2076-31		"	"
D105	1S2076-31		"	"
D106	1S2076-31		"	"
D107	1S2076-31		"	"
D108	1S2076-31		"	"
D201	XZ-132		"	JRC
D202	XZ-132		"	"
D203	XZ-132		"	"
D204	XZ-132		"	"

### Capacitors

Item No.	Part Number	Rating		Description
C101	QFS22HK-470	47 pF	500 V	Polystyrol
C102	QFS22HK-470	"	"	"
C103	QET51CR-107H	100 $\mu$ F	16 V	Electrolytic
C104	QET51CR-107H	"	"	"
C105	QFM31HJ-473	0.047 $\mu$ F	50 V	Mylar
C106	QFM31HJ-473	"	"	"
C107	QFP31HJ-391	390 pF	"	Polypropylene
C108	QFP31HJ-391	"	"	"
C109	QFS22HK-470	47 pF	500 V	Polystyrol
C110	QFS22HK-470	"	"	"
C111	QFS22HK-470	"	"	"
C112	QFS22HK-470	"	"	"
C113	QFM31HJ-333	0.033 $\mu$ F	50 V	Mylar
C114	QFM31HJ-333	"	"	"
C115	QFZ0074-474	0.47 $\mu$ F	250 V	Film
C116	QFZ0074-474	"	"	"
C117	QFZ0080-225	2.2 $\mu$ F	"	"
C118	QFZ0080-225	"	"	"
C119	QFP31HG-622	6200 pF	50 V	Polypropylene
C120	QFP31HG-622	"	"	"
C121	QFP31HG-432	4300 pF	"	"
C122	QFP31HG-432	"	"	"
C123	QFP31HG-272	2700 pF	"	"
C124	QFP31HG-272	"	"	"
C125	QFP31HG-102	1000 pF	"	"
C126	QFP31HG-102	"	"	"
C127	QET51AR-227H	220 $\mu$ F	10 V	Electrolytic
C128	QET51AR-227H	"	"	"
C131	QFZ0074-474	0.47 $\mu$ F	250 V	Film
C132	QFZ0074-474	"	"	"
C133	QFP31HJ-102	1000 pF	50 V	Polypropylene
C134	QFP31HJ-102	"	"	"
C135	QFP31HJ-121	120 pF	"	"
C136	QFP31HJ-121	"	"	"
C203	QET51HR-476E	47 $\mu$ F	"	Electrolytic
C204	QET51HR-476E	"	"	"
C211	QET51CR-227H	220 $\mu$ F	16 V	"
C212	QET51CR-227H	"	"	"
C215	QET51CR-227H	"	"	"
C216	QET51CR-227H	"	"	"
C217	QCS21HJ-390	39 pF	50 V	Ceramic
C218	QCS21HJ-390	"	"	"
C219	QET52AR-107H	100 $\mu$ F	100 V	Electrolytic
C220	QET52AR-107H	"	"	"
C221	QET52AR-107H	"	"	"
C222	QET52AR-107H	"	"	"
C223	QET52AR-107H	"	"	"
C224	QET52AR-107H	"	"	"

## Resistors

Item No.	Part Number	Rating		Description
R101	QRD141J-101S	100 $\Omega$	1/4 W	Carbon
R102	QRD141J-101S	"	"	"
R103	QRD141J-104SL	100 k $\Omega$	"	"
R104	QRD141J-104SL	"	"	"
R105	QRD141J-5R6S	5.6 $\Omega$	"	"
R106	QRD141J-5R6S	"	"	"
R107	QRD141J-153S	15 k $\Omega$	"	"
R108	QRD141J-153S	"	"	"
R109	QRD141J-183S	18 k $\Omega$	"	"
R110	QRD141J-183S	"	"	"
R111	QRD141J-220S	22 $\Omega$	"	"
R112	QRD141J-220S	"	"	"
R113	QRD129J-271	270 $\Omega$	1/2 W	"
R114	QRD129J-271	"	"	"
R115	QRD141J-102S	1 k $\Omega$	1/4 W	"
R116	QRD141J-102S	"	"	"
R117	QRD141J-4R7S	4.7 $\Omega$	"	"
R118	QRD141J-4R7S	"	"	"
R119	QRD129J-392	3.9 k $\Omega$	1/2 W	"
R120	QRD129J-392	"	"	"
R121	QRD129J-392	"	"	"
R122	QRD129J-392	"	"	"
R123	QRD129J-392	"	"	"
R124	QRD129J-392	"	"	"
R125	QRD129J-392	"	"	"
R126	QRD129J-392	"	"	"
R127	QRD141J-183S	18 k $\Omega$	1/4 W	"
R128	QRD141J-183S	"	"	"
R129	QRD141J-102S	1 k $\Omega$	"	"
R130	QRD141J-102S	"	"	"
R131	QRD141J-102S	"	"	"
R132	QRD141J-102S	"	"	"
R133	QRD141J-101S	100 $\Omega$	"	"
R134	QRD141J-101S	"	"	"
R135	QRD141J-101S	"	"	"
R136	QRD141J-101S	"	"	"
R137	QRD141J-472S	4.7 k $\Omega$	"	"
R138	QRD141J-472S	"	"	"
R139	QRD141J-243S	24 k $\Omega$	"	"
R140	QRD141J-243S	"	"	"
R141	QRD141J-271S	270 $\Omega$	"	"
R142	QRD141J-271S	"	"	"
R143	QRD141J-242S	2.4 k $\Omega$	"	"
R144	QRD141J-242S	"	"	"
R145	QRD141J-913S	91 k $\Omega$	"	"
R146	QRD141J-913S	"	"	"
R147	QRD141J-221S	220 $\Omega$	"	"
R148	QRD141J-221S	"	"	"
R149	QRD141J-332S	3.3 k $\Omega$	"	"
R150	QRD141J-332S	"	"	"
R151	QRD141J-221S	220 $\Omega$	"	"
R152	QRD141J-221S	"	"	"
R153	QRD141J-331S	330 $\Omega$	"	"
R154	QRD141J-331S	"	"	"
R155	QRD129J-123	12 k $\Omega$	1/2 W	"
R156	QRD129J-123	"	"	"
R157	QRD129J-123	"	"	"
R158	QRD129J-123	"	"	"
R159	QRD149J-330S	33 $\Omega$	1/4 W	"
R160	QRD149J-330S	"	"	"
R161	QRD149J-330S	"	"	"
R162	QRD149J-330S	"	"	"
R163	QRD141J-105S	1 M $\Omega$	"	"
R164	QRD141J-105S	"	"	"
R165	QRD141J-682SL	6.8 k $\Omega$	"	"

Item No.	Part Number	Rating		Description
R166	QRD141J-682SL	6.8 k $\Omega$	1/4 W	Carbon
R167	QRD141J-274SL	270 k $\Omega$	"	"
R168	QRD141J-274SL	"	"	"
R169	QRD141J-223SL	22 k $\Omega$	"	"
R170	QRD141J-223SL	"	"	"
R171	QRD141J-361S	360 $\Omega$	"	"
R172	QRD141J-361S	"	"	"
R175	QRD141J-102SL	1 k $\Omega$	"	"
R176	QRD141J-102SL	"	"	"
R177	QRD141J-113SL	11 k $\Omega$	"	"
R178	QRD141J-113SL	"	"	"
R179	QRD141J-113SL	"	"	"
R180	QRD141J-113SL	"	"	"
R181	QRD141J-475SL	4.7 M $\Omega$	"	"
R182	QRD141J-475SL	"	"	"
R183	QRD141J-300S	30 $\Omega$	"	"
R184	QRD141J-300S	"	"	"
R187	QRD141J-105S	1 M $\Omega$	"	"
R188	QRD141J-105S	"	"	"
R189	QRD141J-471S	470 $\Omega$	"	"
R190	QRD141J-471S	"	"	"
R191	QRD141J-103S	10 k $\Omega$	"	"
R192	QRD141J-103S	"	"	"
R193	QRD141J-103S	"	"	"
R194	QRD141J-103S	"	"	"
R195	QRD141J-682S	6.8 k $\Omega$	"	"
R196	QRD141J-682S	"	"	"
R197	QRD141J-622S	6.2 k $\Omega$	"	"
R198	QRD141J-622S	"	"	"
R199	QRD141J-471S	470 $\Omega$	"	"
R200	QRD141J-471S	"	"	"
R201	QRX027J-150	15 $\Omega$	2 W	Oxide Metal Film
R202	QRX027J-150	"	"	"
R203	QRX027J-220	22 $\Omega$	"	"
R204	QRX027J-220	"	"	"
R205	QRD141J-103S	10 k $\Omega$	1/4 W	Carbon
R206	QRD141J-103S	"	"	"
R207	QRD141J-272S	2.7 k $\Omega$	"	"
R208	QRD141J-272S	"	"	"
R209	QRD141J-562S	5.6 k $\Omega$	"	"
R210	QRD141J-562S	"	"	"
R211	QRD141J-472S	4.7 k $\Omega$	"	"
R212	QRD141J-472S	"	"	"
R213	QRD141J-472S	"	"	"
R214	QRD141J-472S	"	"	"
R215	QRD141J-471S	470 $\Omega$	"	"
R216	QRD141J-471S	"	"	"
R217	QRD141J-100S	10 $\Omega$	"	"
R218	QRD141J-100S	"	"	"
R221	QRG017J-222S	2.2 k $\Omega$	1 W	Oxide Metal Film
R222	QRG017J-222S	"	"	"
R223	QRD141J-470S	47 $\Omega$	1/4 W	Carbon
R224	QRD141J-470S	"	"	"
R225	QRD129J-822	8.2 k $\Omega$	1/2 W	"

## Others

Item No.	Part Number	Rating	Description
12P	E61537-001		Heat Sink
2P	E03782-012B		Plug
3P	QMV5005-002		"
S101	QMV5005-003		"
S101	QSS4201-501		Slide Switch
S102	QSS4201-501		"

## 8-(5) TXX-184A Switch Unit P.C.Board Ass'y

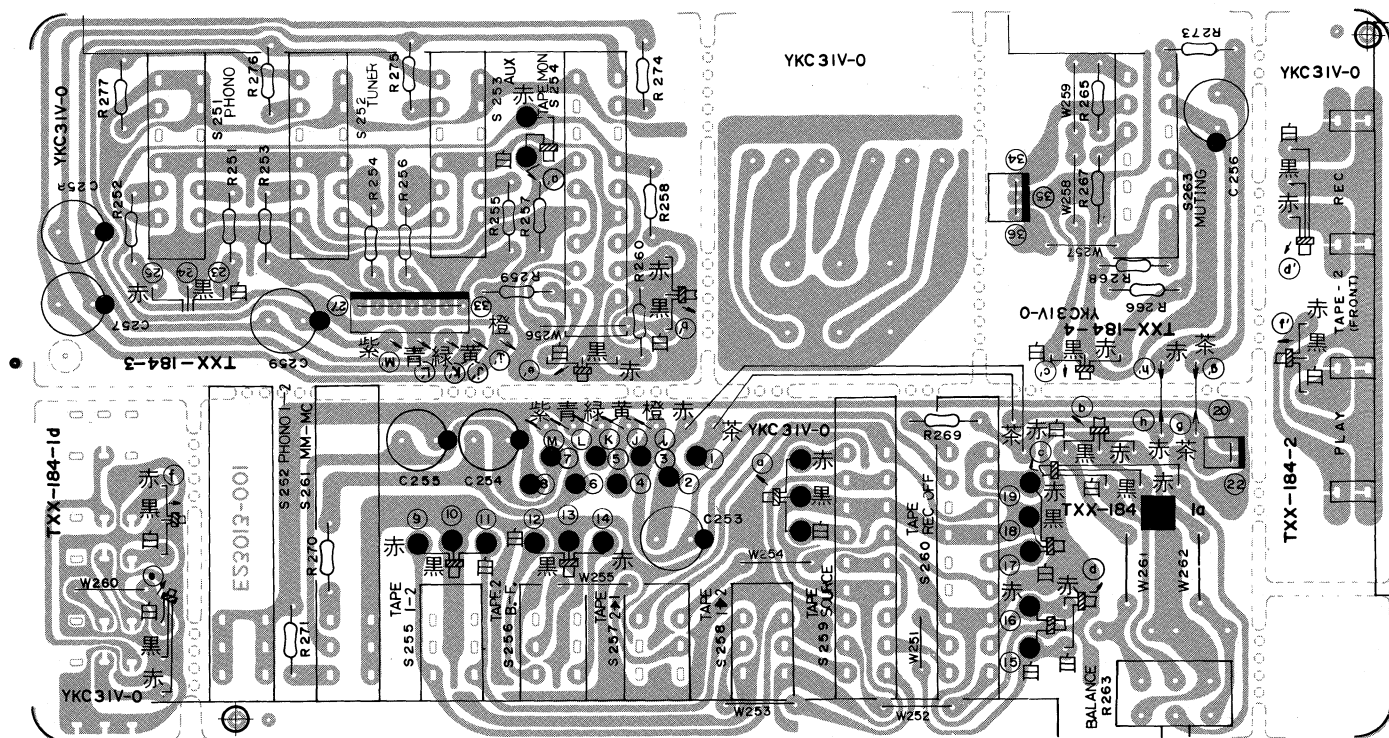
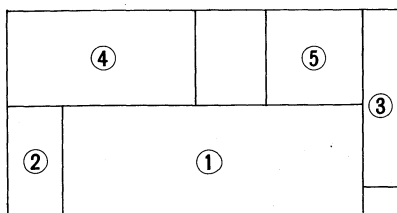


Fig. 21



- ① TXX-184A-1a: Tape Switch P.C. Board Ass'y
- ② TXX-184-1b: " "
- ③ TXX-184-2: Front Tape Pin Jack P.C. Board Ass'y
- ④ TXX-184-3: Source Switch P.C. Board Ass'y
- ⑤ TXX-184-4: Muting Switch P.C. Board Ass'y

**Note:** The specific symbols ( 赤, 黒, 白 ... etc.) on a surface of above P.C. Board are actually unrelated to the repair service and are significant denotement in order to process the proper assembly of P.C. Board at the factory.

### Capacitors.

Item No.	Part Number	Rating	Description
C253	QET50JR-477	470 $\mu$ F 6.3 V	Electrolytic
C254	QET50JR-477	" "	"
C255	QET50JR-477	" "	"
C256	QET50JR-477	" "	"
C257	QET50JR-477	" "	"
C258	QET50JR-477	" "	"
C259	QET50JR-477	" "	"

Item No.	Part Number	Rating	Description
R269	QRD141J-560S	56 $\Omega$ 1/4 W	Carbon
R270	QRD141J-560S	" "	"
R271	QRD141J-560S	" "	"
R273	QRD141J-560S	" "	"
R274	QRD141J-560S	" "	"
R275	QRD141J-560S	" "	"
R276	QRD141J-560S	" "	"
R277	QRD141J-560S	" "	"

### Resistors

Item No.	Part Number	Rating	Description
R251	QRD141J-331S	330 $\Omega$ 1/4 W	Carbon
R252	QRD141J-331S	" "	"
R253	QRD141J-331S	" "	"
R254	QRD141J-331S	" "	"
R255	QRD141J-331S	" "	"
R256	QRD141J-331S	" "	"
R257	QRD141J-105S	1 M $\Omega$	"
R258	QRD141J-105S	" "	"
R259	QRD141J-105S	" "	"
R260	QRD141J-105S	" "	"
R263	QVD7A3M-1F5V	250 k $\Omega$ 0.15 W	Variable (Carbon)
R265	QRD141J-823S	82 k $\Omega$ 1/4 W	Carbon
R266	QRD141J-823S	" "	"
R267	QRD141J-103S	10 k $\Omega$	"
R268	QRD141J-103S	" "	"

### Others

Item No.	Part Number	Rating	Description
E6333	QWT011-011		Terminal Wire Ass'y
EQ	EWS013-006		Socket Wire Ass'y
VOL	QMV5005-003		Plug
15P	EWS02F-001		Socket Wire Ass'y
2P	QMV5005-002		Plug
7P	QMV5005-007		"
IND.	EWS018-008		Socket Wire Ass'y
1 KEY	QSP0210-104		Push Switch
4 KEY	QSP0241-003		"
8 KEY	QSH1P01-001		"
FRONT	EMN00YV-401A		Pin Jack

## 8-(6) TXX-185B, C or D Electrolytic Capacitors P.C. Board Ass'y

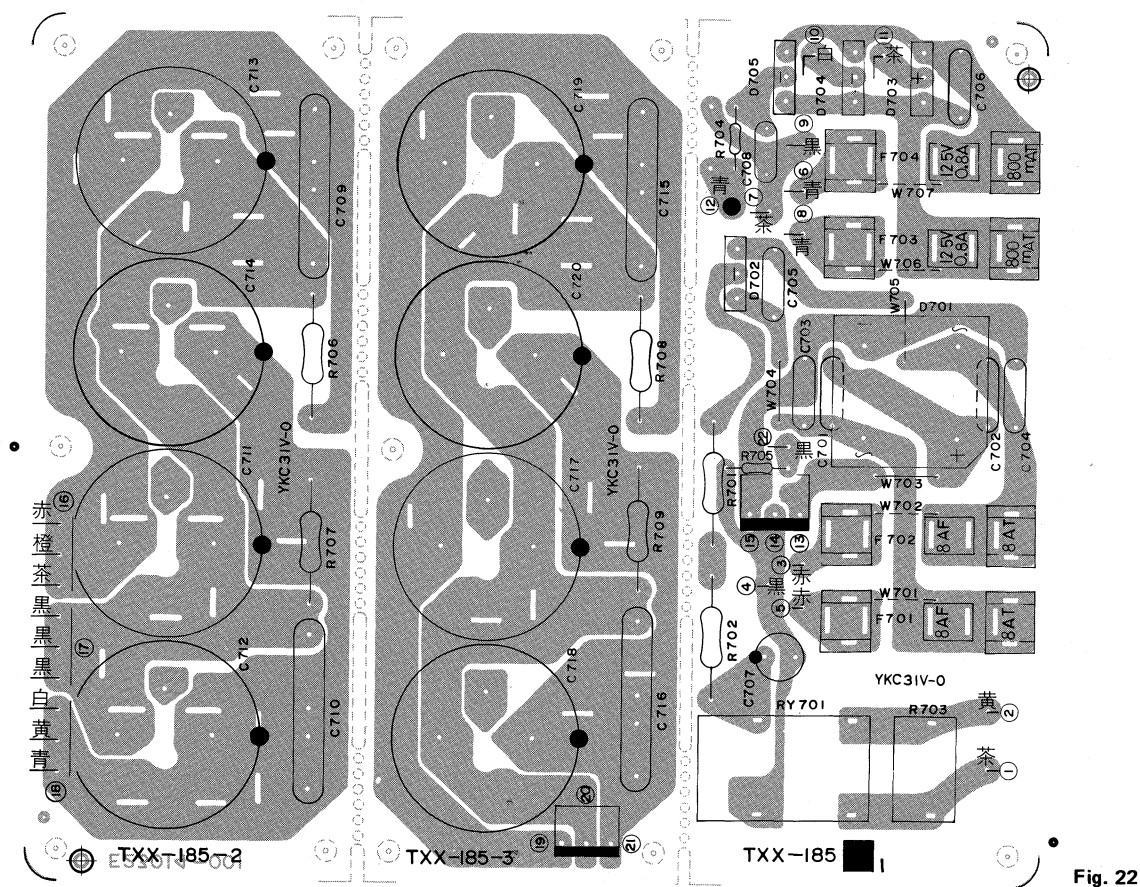
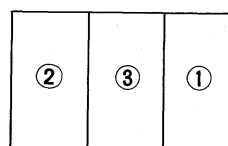


Fig. 22



- ① TXX-185B, C, D-1: Diode P.C. Board Ass'y  
 ② TXX-185-2: Electrolytic Capacitors P.C. Board Ass'y  
 ③ TXX-185-3: Electrolytic Capacitors P.C. Board Ass'y

### Diodes

Item No.	Part Number	Rating	Description	Maker
D701	S5VB20		Silicon	Shindengen
D702	S2VC20R		"	"
D703	S2VC20		"	"
D704	S2VC20R		"	"
D705	S2VC20R		"	"

### Capacitors

Item No.	Part Number	Rating	Description
C701	QFZ0074-104	0.1 $\mu$ F	250 V Mylar
C702	QFZ0074-104	"	"
C703	QFZ0074-104	"	"
C704	QFZ0074-104	"	"
C705	QFZ0072-223	0.022 $\mu$ F	630 V Film
C706	QFZ0072-223	"	"
C707	QET51HR-476	47 $\mu$ F	50 V Electrolytic
C708	QFM42AK-563	0.056 $\mu$ F	100 V Mylar
C711	EEW91KA-827	820 $\mu$ F	82 V Electrolytic
C712	EEW91KA-827	"	"
C713	EEZ0059-478	4700 $\mu$ F	71 V "
C714	EEZ0059-478	"	"
C717	EEZ0059-478	"	"
C718	EEZ0059-478	"	"
C719	EEZ0059-478	"	"
C720	EEZ0059-478	"	"

### Resistors

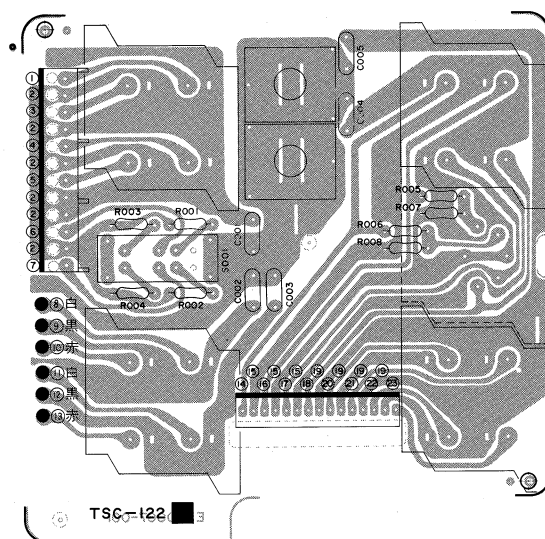
Item No.	Part Number	Rating	Description
R701	QRG027J-221	220 $\Omega$ 2 W	Oxide Metal Film
R702	QRG027J-271	270 $\Omega$ "	"
R703	ERF031K-3R3	3.3 $\Omega$ 3 W	Uninflammable
R704	QRD141J-104S	100 k $\Omega$ 1/4 W	Carbon
R705	QRD141J-5R6S	5.6 $\Omega$ "	"
R706	QRG027J-103	10 k $\Omega$ 2 W	Oxide Metal Film
R707	QRG027J-103	"	"
R708	QRG027J-103	"	"
R709	QRG027J-103	"	"

### Others

Item No.	Part Number	Rating	Description
	EWT011-016		Terminal Wire Ass'y
	E10381-001		Case
	E45524-002		Fuse Clip (TXX-185B, C)
	E48965-002		" (TXX-185C, D)
3P	EWS043-004		Socket Wire Ass'y
3P	E03782-003A		Plug
MAIN	EWS063-004		Plug Wire Ass'y
RY701	ESK1D24-113		Relay Switch
TRA(A)	EWS064-002		Plug Wire Ass'y
TRA(B)	EWS063-001		"
185-1	EWS043-002		Socket Wire Ass'y
185-3	EWS043-003		"



## 8-(7) TSC-122B Pin Jack P.C.Board Ass'y



### Note:

The specific symbols ( 赤,黒,白 ... etc.) on a surface of above P.C. Board are actually unrelated to the repair service and are significant denotement in order to process the proper assembly of P.C. Board at the factory.

Fig. 23

### Capacitors

Item No.	Part Number	Rating		Description
C001	QFP31HJ-103	0.01 $\mu$ F	50 V	Polypropylene
C002	QFP31HJ-103	"	"	"
C003	QFP31HJ-103	"	"	"
C004	QFP31HJ-103	"	"	"
C005	QFP31HJ-103	"	"	"

Item No.	Part Number	Rating		Description
R006	QRD141J-334S	330 k $\Omega$	1/4 W	Carbon
R007	QRD141J-104S	100 k $\Omega$	"	"
R008	QRD141J-104S	"	"	"

### Resistors

Item No.	Part Number	Rating		Description
R001	QRD141J-104SL	100 k $\Omega$	1/4 W	Carbon
R002	QRD141J-104SL	"	"	"
R003	QRD141J-101SL	100 $\Omega$	"	"
R004	QRD141J-101SL	"	"	"
R005	QRD141J-334S	330 k $\Omega$	"	"

### Others

Item No.	Part Number	Rating	Description
S001	E03591-42D		Pin Jack
	E03591-42D		"
	E03591-42DG		"
	E03763-001		GND Terminal
	QSS2301-004		Slide Switch
AU, TU	EWS017-004		Socket Wire Ass'y
DIN4P	EMN10TP-401A		Pin Jack
PHONO	E03809-012B		Socket
TAPE	E03686-015H		Plug

## 8-(8) TPS-219A, B or C AC Outlets and Voltage Selector P.C. Board Ass'y

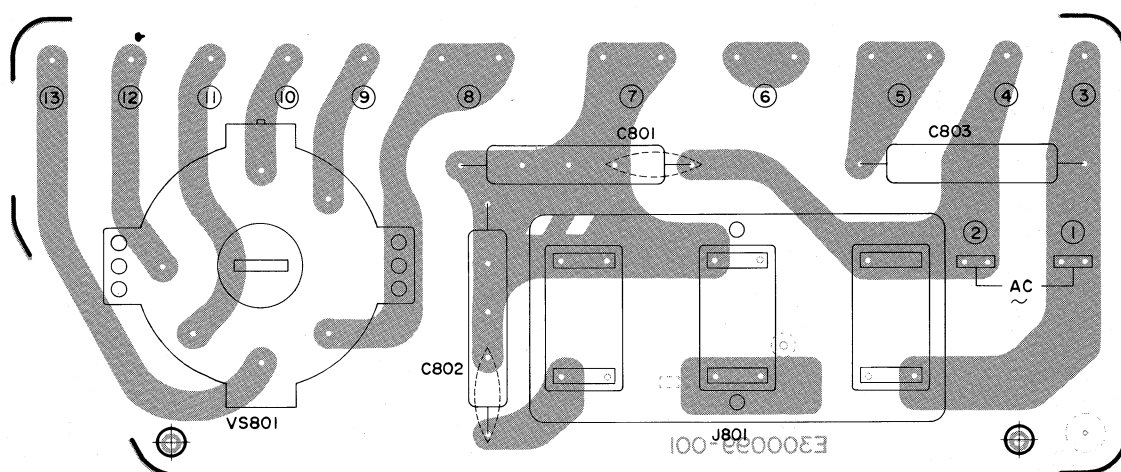


Fig. 24

### Capacitors

Item No.	Part Number	Rating		Description
C801	QCZ9014-103	0.01 $\mu$ F		Ceramic (TPS-219A)
C801	QFZ9007-103	"		Film (TPS-219B,C)
C802	QCZ9014-103	"		Ceramic (TPS-219A)
C802	QFZ9007-103	"		Film (TPS-219B)
C803	QFZ9007-103	"		" (TPS-219C)

### Others

Item No.	Part Number	Rating	Description
	E65586-002		Bracket (TPS-219C)
	QMC0637-003		AC Outlets (TPS-219A,B)
	QSR0085-001		Voltage Selector (TPS-219A,B,C)



## 9. Packing Materials and Part Numbers

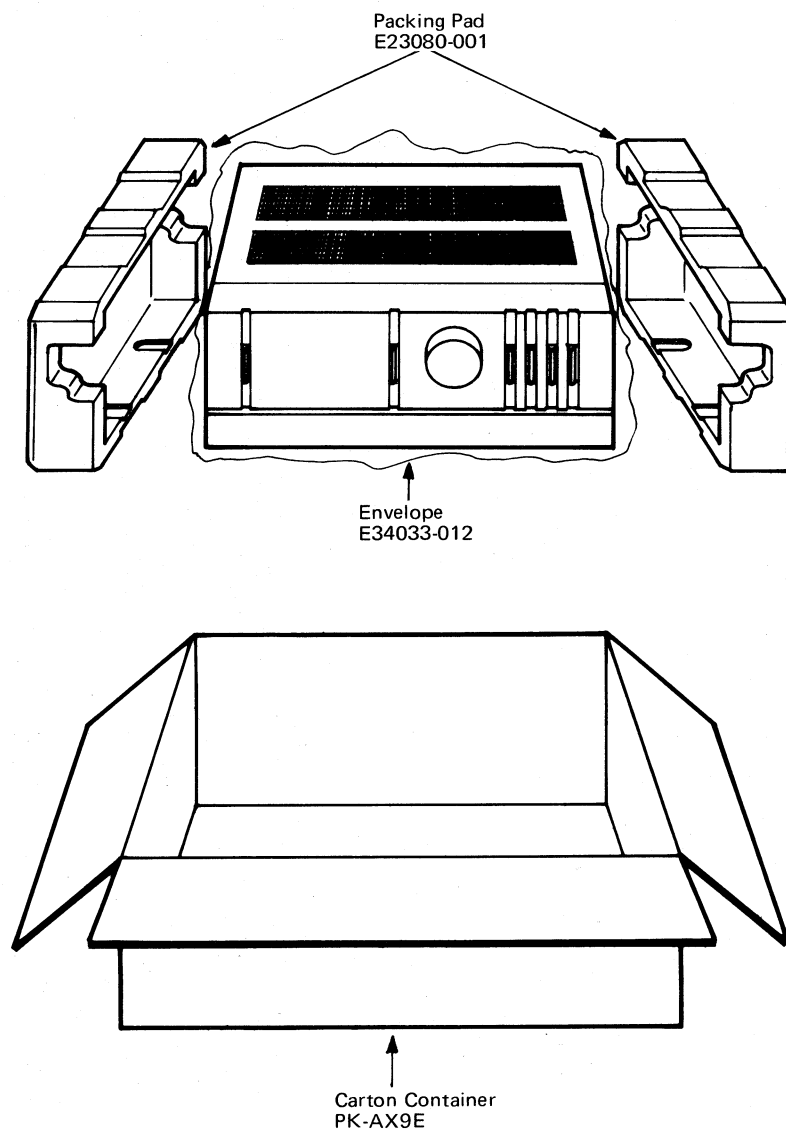


Fig. 25

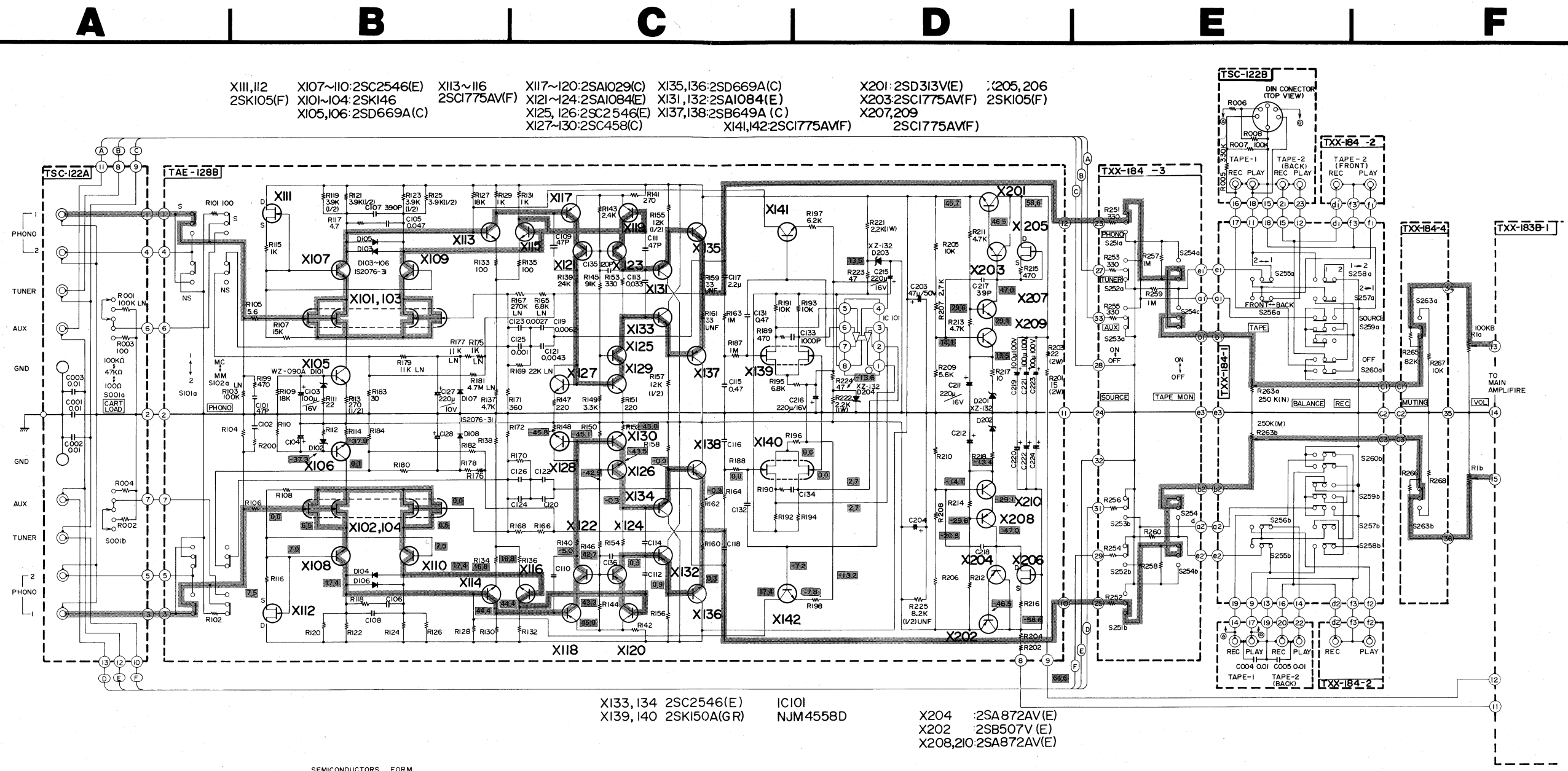
## 10. Accessories List

Item No.	Part Number	Description	Q'ty
1	E30580-725A	Instruction Book	1
2	See table below.	Warranty Card	1
3	E64207-002	Envelope for Instruction Book and Warranty Card	1
4	BT20024B	"Do It Better" (for U.S.A. only)	1
5	BT20023	Service Procedures (for U.S.A. only)	1
6	QMF51A2-3R15S or 6R3S	Fuse (for U.S. Military Market and Others) ⚠	1
7	E64208-001	Envelope for Fuses (for U.S. Military Market and Others)	1
8	E66188-028 or 029	Fuse Label (for U.S. Military Market and Others)	1
9	E64216-002	Caution Tag (with Power Cord for Military Market only)	1

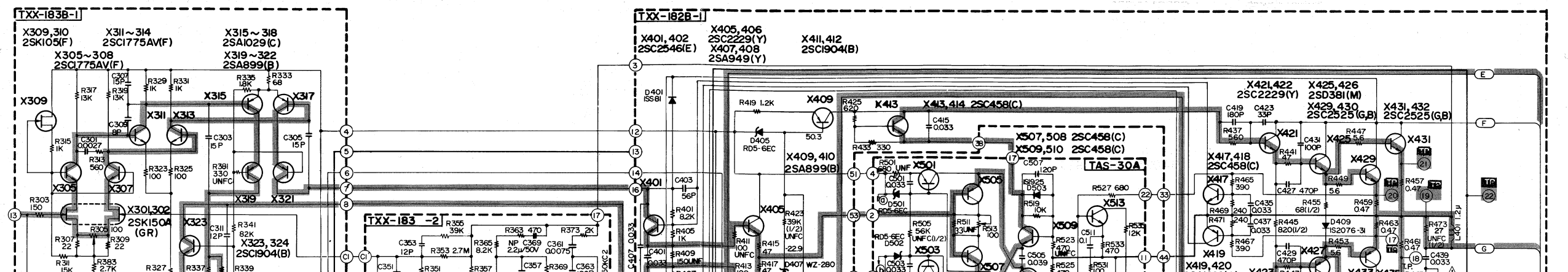
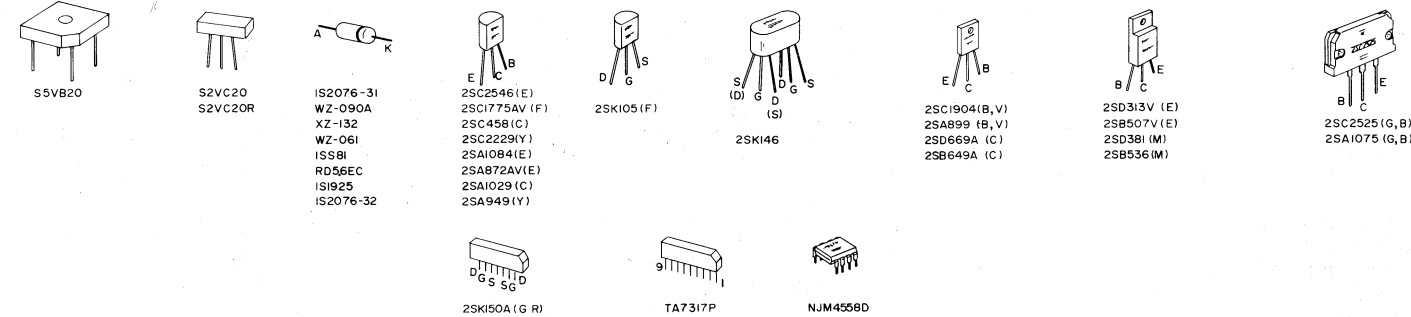
### Warranty Card

U.S.A.	Canada	U.S. Military Market	Europe	Australia	U.K.
BT20032B	BT20025C	BT20032	—	BT20029B	BT20013B

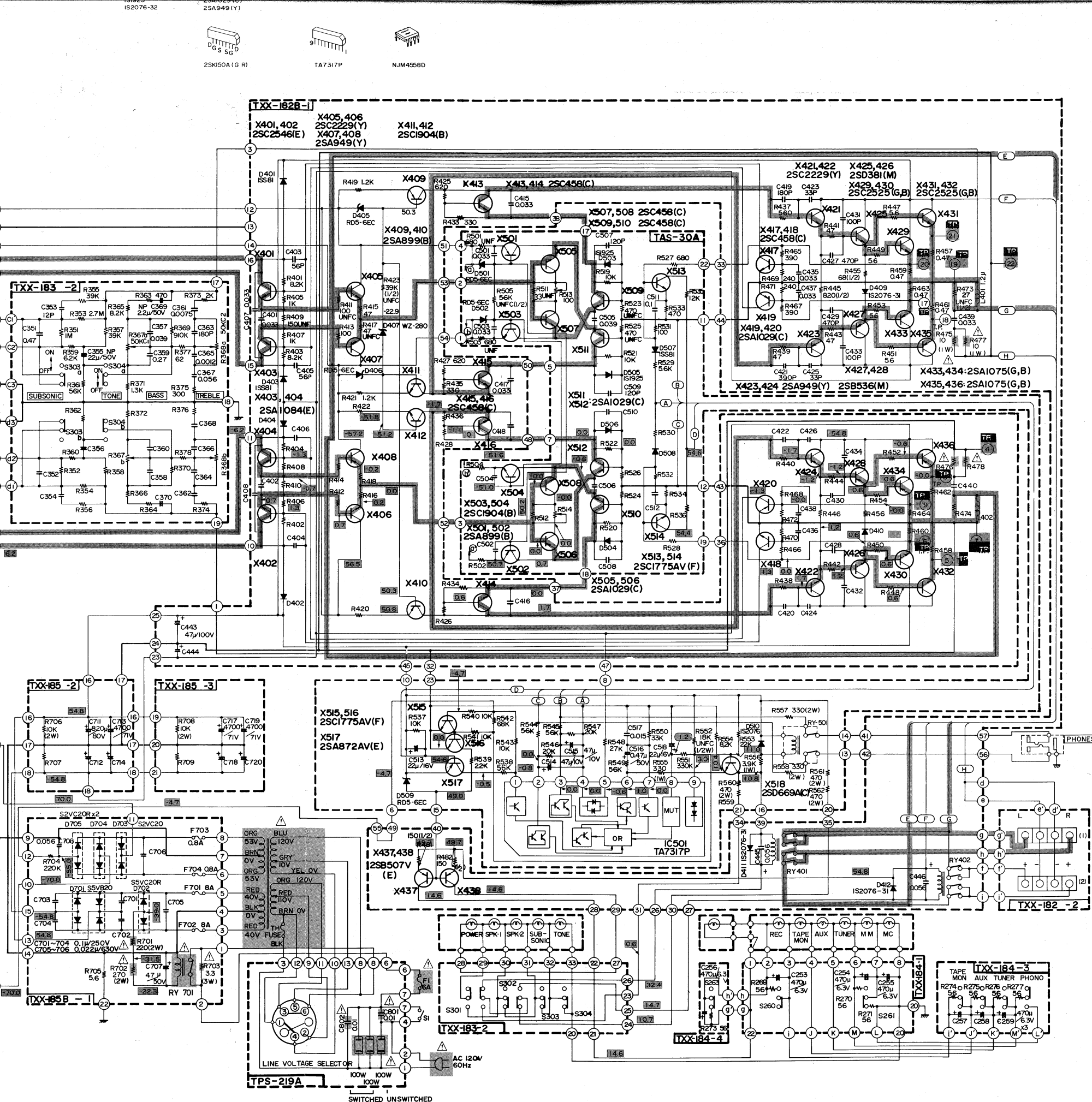
# 11.A-X9 Schematic Diagram (for U.S.A. and Canada)



SEMICONDUCTORS FORM







5. When replacing the  $\Delta$  marked parts, be sure to use the designated parts to ensure safety.
  - Power cord : Different in different areas. See page 28.
  - AC outlet : Different in different areas. See page 28.
  - Power switch : QSP2111-031
  - Fuse : Different in different areas. See page 28.
  - Power transformer : E03617-14B
  - Ceramic condenser : Different in different areas. See page 28.
  - Relay : ESK1D24-113 (RY701)
  - Cement resistor : ERF031K-3R3 (R703)
  - Incombustible oxide of metal film resistor : ORG027J-(R701, R702)
  - Incombustible metal film resistor : QRX027J-(R201~R204)
  - Incombustible metal film resistor : QRD149J-(R159~R162, R479, R480)
  - Fusible resistor : QRZ0049-(R475~R478)
  - QRZ0050-(R615, R616)

6. Resistors are indicated as follows;
  - Unit No indication :  $\Omega$
  - K : k $\Omega$
  - M : M $\Omega$
  - W : watt
  - Deviation No indication :  $\pm 5\%$
  - J :  $\pm 5\%$
  - K :  $\pm 10\%$
  - Type No indication : Carbon resistor
7. Capacitors are indicated as follows;
  - Unit No indication :  $\mu F$
  - $\mu$  :  $\mu F$
  - P : F
8. This is the standard circuit diagram. The design and constants are subject to change without notice.

### Printed Circuit Board Ass'y Locations

P.C. Board Ass'y	Description	Page
TX-182B	Power Amp. and Speaker Connector P.C. Board Ass'y	12
TAS-30A	Bias Control and Protector P.C. Board Ass'y	15
TX-183B	Driver Amp. and Tone Control P.C. Board Ass'y	16
TAE-128B	Equalizer Amp. P.C. Board Ass'y	19
TX-184A	Switch Unit P.C. Board Ass'y	22
TX-185B, C or D	Electrolytic Capacitors P.C. Board Ass'y	23
TSC-122B	Pin Jack P.C. Board Ass'y	24
TSP-219A, B or C	AC Outlets and Voltage Selector P.C. Board Ass'y	24

B C D E F

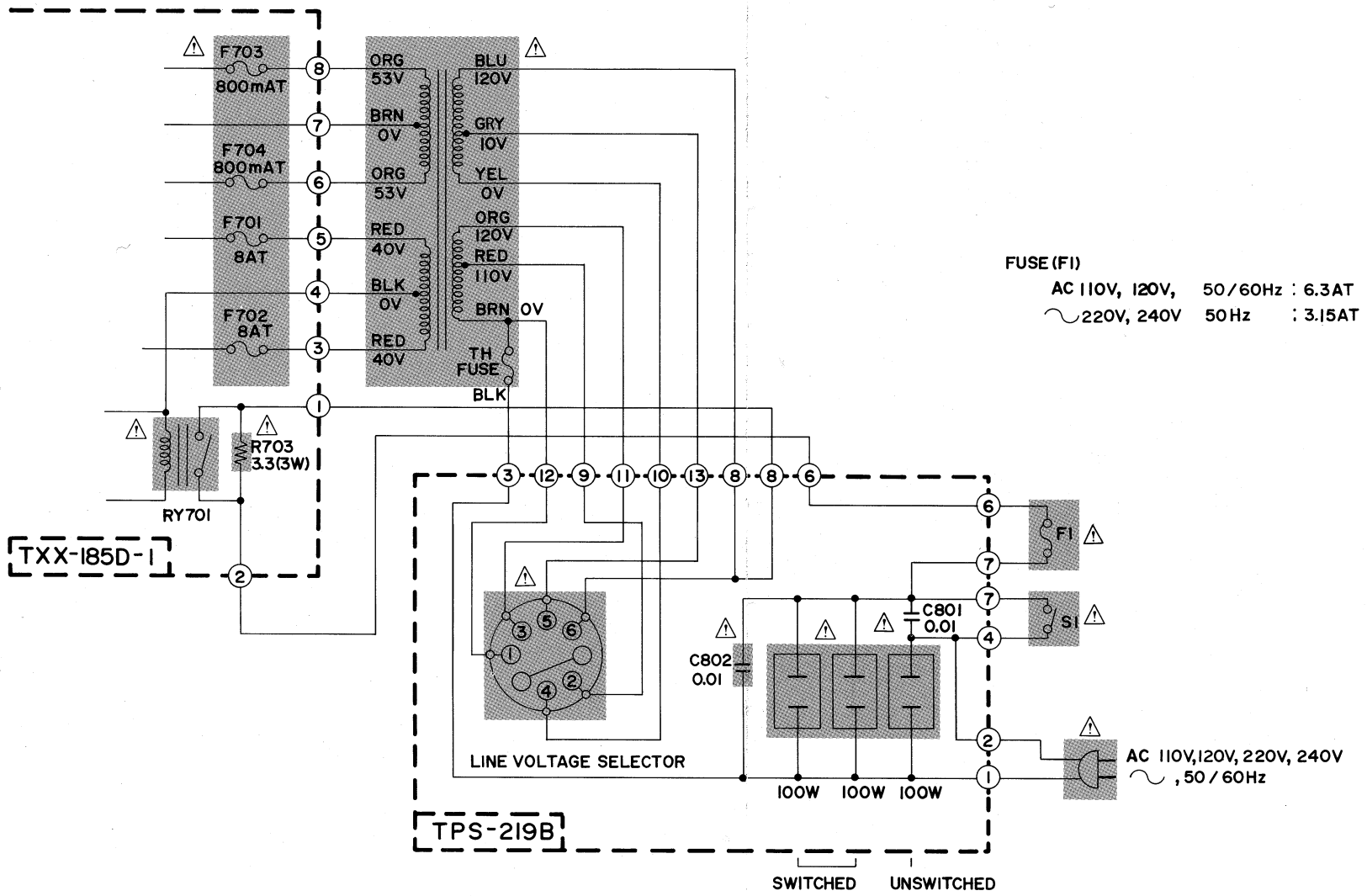




**A****B****C**

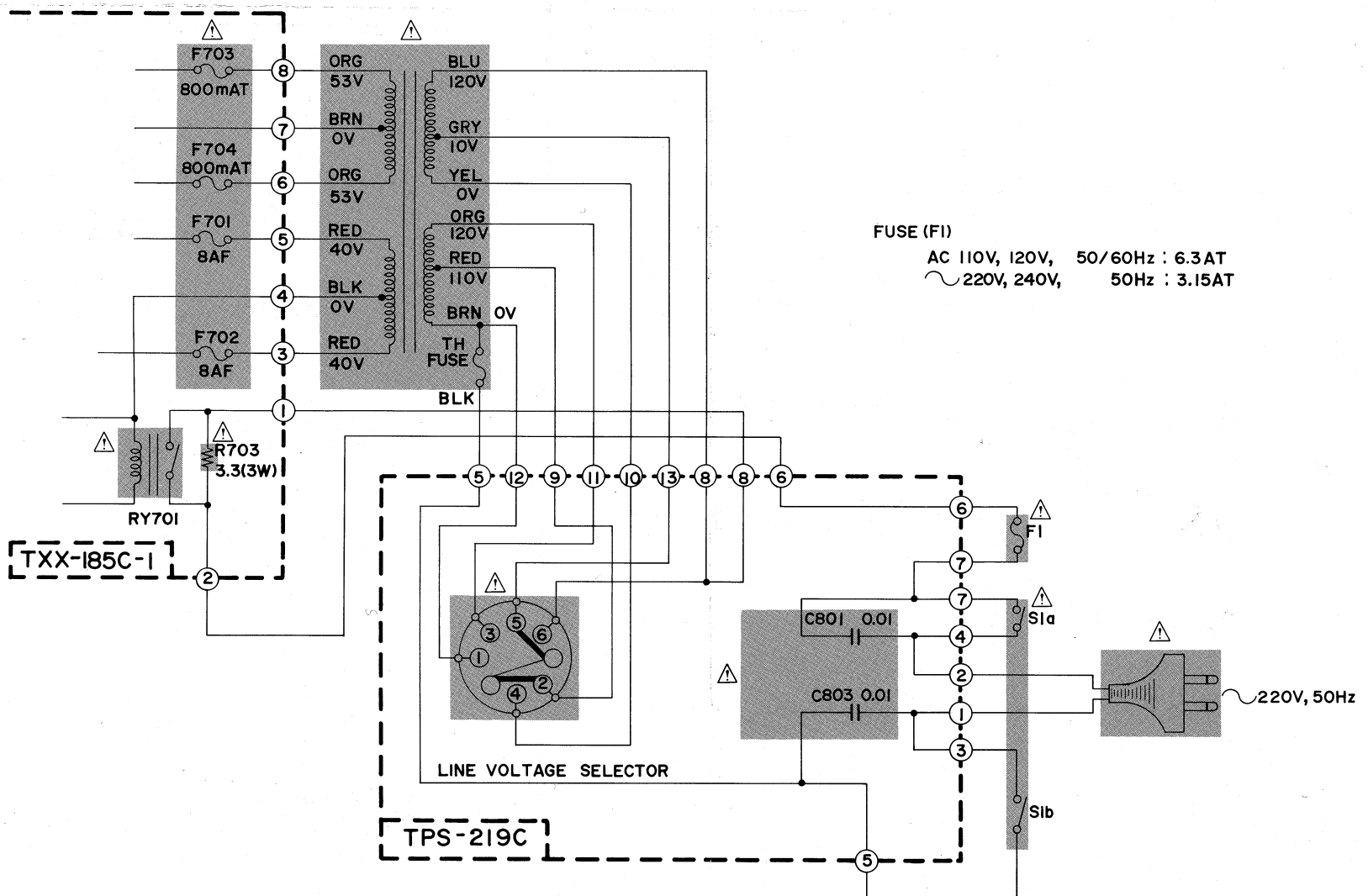
(U) for OTHER COUNTRIES  
(P) for PACEX

PRIMARY : AC 110V, 120V, 220V, 240V ~ 50/60Hz



(E) for EUROPE

PRIMARY : ~ 220V, 50Hz



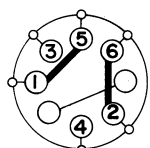
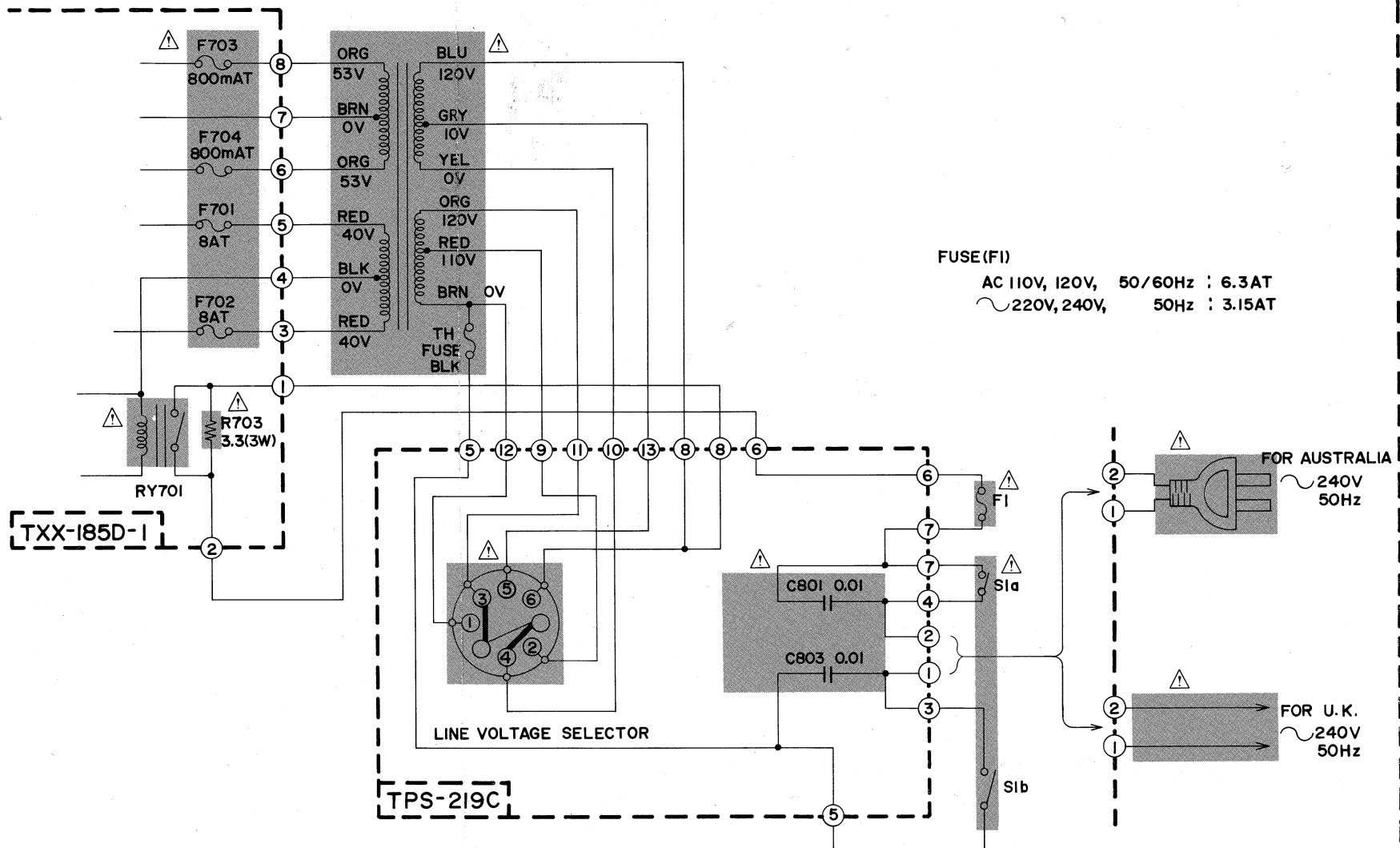
D

E

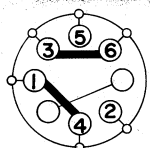
F

(B) for UNITED KINGDOM  
(A) for AUSTRALIA

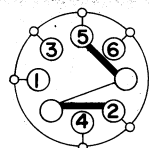
PRIMARY : ~ 240V, 50Hz



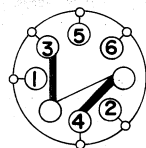
110V



120V



220V



240V

TOP VIEW

VOLTAGE SELECTOR CONNECTION

50Hz

D







E

F

NOTE: ⚠ SAFETY PARTS



## 12. Parts List with Specified Numbers for Designated Areas

Page	Item No.	Description	U.S.A.	Canada	U.S. Military Market & Other Countries	Europe	Australia	U.K.
	F701, 702 F703, 704	Power Cord 	QMP1200-200	QMP1200-200	QMP1200-200	QMP4100-200 QMP4400-200 (Switzerland)	QMP2610-200	QMP9017-008
		Fuse Holder 	QMG0201-003	QMG0201-003	QMG0301-003	QMG0301-003	QMG0301-003	QMG0301-003
		Fuse  (Primary)	QMF61U1-6R0	QMF61U1-6R0	QMF51A2-6R3S QMF51A2-3R15S	QMF51A2-3R15S	QMF51A2-3R15S	QMF51A2-3R15S
		(Secondary)	QMF61U1-8R0	QMF61U1-8R0	QMF51A2-8R0L	QMF0003-8R0S	QMF51A2-8R0L	QMF51A2-8R0L
		(Secondary)	QMF61U1-R80	QMF61U1-R80	QMF51A2-R80L	QMF51A2-R80L	QMF51A2-R80L	QMF51A2-R80L
		E. Capacitors						
		P.C. Board						
		Ass'y 	TXX-185B	TXX-185B	TXX-185D	TX X-185C	TXX-185D	TXX-185D
		Outlets and V. Selector						
		P.C. Board						
		Ass'y 	TPS-219A	TPS-219A	TPS-219B	TPS-219C	TPS-219C	TPS-219C
		AC Outlet	QMC0637-003	QMC0637-003	QMC0637-003	—	—	—
		AC Line						
		Capacitor 	QCZ9014-103	QCZ9014-103	QFZ9007-103	QFZ9007-103	QFZ9007-103	QFZ9007-103

NOTE:  SAFETY PARTS